LTC Paper

WORKSHOP PROCEEDINGS
for
GENDER AND NATURAL RESOURCE TENURE RESEARCH

A WORKSHOP SPONSORED BY THE LAND TENURE CENTER OF THE UNIVERSITY OF WISCONSIN-MADISON

3-4 OCTOBER 1991

LAND TENURE CENTER

An Institute for Research and Education
on Social Structure, Rural Institutions,
Resource Use and Development

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by

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WORKSHOP COORDINATOR

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INTRODUCTION

On 3-4 October 1991, the Land Tenure Center (LTC), University of Wisconsin-Madison, hosted a workshop entitled "Gender and Natural Resource Tenure Research." The workshop was funded with a grant from the US Agency for International Development, Office of Women in Development. The conference was organized by Nancy Sheehan and Susana Lastarria of the Land Tenure Center. Participants included LTC research staff and selected UW faculty and graduate students.[1]

This workshop is part of a larger initiative undertaken by LTC research staff. In 1990, LTC embarked on an institution-wide "Women and Land Tenure" project, the primary activities of which include:

- re-examining existing LTC data gathered from large statistical surveys in an effort to distill information on women and tenure patterns;
- bringing gender components into ongoing LTC research programs;
- designing future research projects which address several crosscutting themes: the impacts of land reform programs on women's access to and control of resources; the participation of women, as well as men, in the management and conservation of resources; the effect of land markets on women's access to land; and the identification of women's security of tenure; and
- exchanging information on women and land tenure with other researchers.

To carry out these specific project activities, LTC researchers have had to ask several fundamental questions of their research endeavors: What gender biases exist in current research hypotheses and, subsequently, in the methodological tools used? Have these biases resulted in inadequate understanding of both men's and women's relationships to land and other resources? If these gender biases do exist, can modifications to future research designs overcome past discrepancies?

In his introductory remarks to the October workshop, John W. Bruce, LTC Director, stated frankly that LTC has not done a very good job of studying women's access to and control of land and other natural resources. He went on to say that the challenge ahead is to rectify this situation by "finding ways to incorporate gender issues into the kinds of tenure

1. A list of participants can be found in appendix 2.

research LTC is already doing." Bruce also asked: "Is this [incorporation] enough? Or should some LTC projects focus explicitly on women and tenure issues?" The gender analysis workshop represented an initial step toward meeting these challenges.

WORKSHOP CONTENT AND FORMAT

This workshop was to meet three objectives:

- to begin exploring the question: How do the social relations between men and women, among men and among women, structure or determine the multitude of tenure regimes and land-use patterns found around the world?

- to provide information on a variety of research methods useful in assessing and better understanding resource use and tenure patterns resulting from these social relations;[2] and

- to discuss theoretical and methodological issues in terms of LTC's research mandates, that is, to identify present research gaps and future research priorities.

The workshop was organized into two sections. The first day was devoted to gender training exercises.[3] Dr. Kathleen Cloud, Director, Office of Women in International Development, University of Illinois, facilitated these exercises. Her opening comments provided a historical review of gender analysis as a tool for assessing women's as well as men's access to and control of resources, gender divisions of labor, the differences in people's motivations to join in project activities, and the differential impact this participation has for particular groups of individuals (for example, women and men). Dr. Cloud also introduced the concept of training case studies and how two such cases were to be used during the workshop. The second day revolved around interactive discussions among participants and several guest speakers. Four researchers—Drs. Cherub Antwi-Nsiah, Dianne Rocheleau, Ruth Dixon-Mueller, and David Stanfield—joined in a panel discussion of methodological issues. In the afternoon session of the second day, policy implications and research priorities for the Land Tenure Center were identified.

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2. In particular, information on alternatives or complements to formal surveys relying exclusively on standardized questionnaires.

3. The workshop schedule can be found in appendix 3.

GENDER ANALYSIS AND CASE STUDY TRAINING

The use of case studies as a training method was first developed by the Harvard School of Business. Educators hoped to improve the decision-making and problem-solving skills of students and mid-career professionals by analyzing real-life situations in a case study format. With the publication of *Gender Roles in Development Projects*,[4] this case study training method was extended to the field of "women in development" (WID). The authors of *Gender Roles* created a framework useful in assessing *systematically* the past, present, and potential roles and responsibilities of women, as well as men, within particular socioeconomic contexts. This framework is composed of several fundamental questions designed to guide the analysis of accompanying case studies. By providing possible answers to these questions, the reader could begin to see how gender differences in division of labor, in identification of development priorities, and in access to and control of resources could lead to women's and men's participating on different and often unequal terms in the activities of development projects. *Gender Roles* thus established a means for combining "lessons learned" from numerous reports on women's roles in agriculture to practical development/policy planning efforts. *Gender Roles* also created a foundation upon which additional and sectorally adapted gender training materials could be developed.[5]

For the LTC workshop, both the *Gender Roles* framework and a more recently adapted arrangement developed by Farming Systems Research and Extension (FSR/E) researchers were used to analyze two case studies. The workshop organizers felt that the combination of the analytical framework and the case studies would generate useful discussions and, hopefully, create a means for analyzing development/policy issues through a different lens. In addition, the workshop organizers felt that the case studies would provide participants with an opportunity to visit the "field" while remaining in Madison. The cases analyzed were the following:[6]

1) "Household Studies in the Upper Valley Authority Resettlement Project" (Teaching Case: Sections A and B).

   This case synthesizes the events surrounding the design and implementation of three active development projects: the Mudu River Irrigation Project in Malaysia, the Mahawelli Irrigation Settlement Project in Sri Lanka, and the

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4. Catherine Overholt, Mary Anderson, Kathleen Cloud, and James Austin, *Gender Roles in Development Projects* (West Hartford, Conn.: Kumarian Press, 1984).

5. See also the following reference for a definition of gender analysis and the gender analytical framework: Aruna Rao et al., *Gender Training and Development Planning: Learning from Experience*, Conference Report, May 1991 (Bergen, Norway: Population Council and Chr. Michelsen Institute, 1991).

6. Copies of these case studies can be found in appendix 5.

Nemow Case.[7] The case requires readers to establish research priorities at two different times in the synthetic project cycle—before and after the building of a large hydroelectric dam. This case captures the essence of situations commonly faced by researchers and development practitioners. In a short amount of time and as part of a team, researchers must grapple with various socio-cultural concerns (for example, the effects of resettling one ethnic group into an area already inhabited by another) and economic issues (including labor constraints, off-farm employment, marketability of agricultural products, and provision of support/extension services to a growing area).

2) Hilary Sims Feldstein, Dianne Rocheleau, and Louise Buck, "Agroforestry Extension and Research: A Case Study from Siaya District, Kenya."[8]

This case involves a detailed discussion of the planning of a new agroforestry research and extension project. Agroforestry is promoted through an extension-led model for technology development initiated by a nongovernmental organization in the Siaya District, Kenya. As the teaching notes for this case state:

> The main point of this case is the recognition that men and women may have quite different interests with respect to the introduction of agroforestry practices or the domestication of trees. Such differences vary between localities and they are discoverable. Achieving project objectives will depend on a diagnosis which reveals these differences and a design which takes them into account. This case is unique in that research has been initiated by extension institutions. The Forest Department wants an improved extension service and more appropriate technologies to extend. CARE-Kenya is a nongovernment organization extension-like service. There is, at the outset, a marked orientation toward farmer identification of constraints and desirable technologies.[9]

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7. Complete versions of the Mahawelli Project and the Nemow Case can be found in Ingrid Palmer, *The Impact of Agrarian Reform on Women* (West Hartford, Conn.: Kumarian Press, 1985), and Ingrid Palmer, *The Nemow Case* (West Hartford, Conn.: Kumarian Press, 1985).

8. In Hilary Sims Feldstein and Susan V. Poats, eds., *Working Together: Gender Analysis in Agriculture*, vol. 1, *Case Studies* (West Hartford, Conn: Kumarian Press, 1989).

9. Ibid., vol. 2, *Teaching Notes*, p. 173.

While the two cases provided vehicles for discussing gender issues, neither case could be categorized as a "land tenure case study." We viewed the lack of a tenure case study as both a constraint and an opportunity. It was hoped that nontenure cases would force participants to envision access to and control of resources in the broader context of household survival strategies operating within particular farming systems. As such, we deliberately chose to explore gender issues as they pertained to *natural resource* tenure research. Therefore, we did not limit our discussion to *land* tenure research.

There was, however, a constraint to not having a land tenure case study. There are recurring instances in which women's rights to land and other resources are circumscribed by legal inadequacies and societal inequalities. These tenure realities were not emphasized in the nontenure training cases. In the time allotted, neither case adequately illustrated the trials and errors of carrying out tenure research—for example, how gender has emerged as an important social factor in determining the elements of tenure systems; how gender can indicate which segments of the population are more likely to be adversely affected by land tenure reform programs; how men and women might define such concepts as tenure security, productivity, land use, and agricultural investment.

As a result of this constraint, we have begun to ask whether tenure case studies are needed. The recent conference held in Bergen, Norway,[10] is just one indication of the explosion of interest in the case study training method. There is also a growing interest in gender and land tenure issues as demonstrated by the publication of *Agriculture, Women and Land.*[11] Both these phenomena (and others) would seem to show that the answer to our question is: "Yes, there is a need for tenure case studies." The cases are there; their translations into learning tools are not.

SUGGESTIONS AND COMMENTS FROM PARTICIPANTS

Limits of the Frameworks: Participants noted two gaps in the workshop. Some participants felt that there was little room to discuss the cultural/social context, for example, rituals, within which land use takes place. Also, the application of the framework to the case studies left several participants with a bifurcated picture of agricultural activities. These participants felt there should have been more discussion of the complementarity of some agricultural activities undertaken by rural men, women, and children.

Discussion Groups: Throughout the first day participants were asked to form small groups. The discussions and debates during the small group sessions were lively and proved

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10. Aruna Rao et al., *Gender Training and Development Planning: Learning from Experience*, Conference Report, May 1991 (Bergen, Norway: Population Council and Chr. Michelsen Institute, 1991).

11. Jean Davison, ed., *Agriculture, Women and Land* (Boulder, Colo.: Westview Press, 1988).

to be invaluable means for hashing out issues and exploring questions among a multidisciplinary group of people. However, we mistakenly formed these groups without designating discussion leaders. In hindsight, group leaders might have provided better direction for the discussions.

Materials: Information about the gender analysis framework and copies of the case studies were distributed to participants a week before the workshop. While this provided adequate time to read these materials, many participants had not done so. Perhaps the accompanying cover letter should have provided greater detail on how to approach the case studies.

Workshop Scheduling: The phrase, "time was of the essence," succinctly characterizes the workshop. Two days were insufficient to cover all the material. In particular, participants felt that they did not have enough time to read and assimilate the agroforestry case study.[12] In addition, the four panelists who spoke during the second day felt that 20 minutes was inadequate for covering their material.

THE PROCEEDINGS

What follows is an account of the presentations and discussions during this workshop. The style of these proceedings does not markedly differ from that of other workshop accounts. The descriptions of particular sessions have been chronologically ordered with a great deal of synthesizing and paraphrasing. While my aim was to be concise, I hope that the spirit of the workshop has nonetheless been retained. Two short videos have been produced to accompany these written notes.[13] The first video would be useful for those interested in gender case studies as a training method; the second video shows excerpts from the four panel presentations.

Please note that the last section of these proceedings contains the research priorities suggested by LTC staff and other workshop participants. These listed priorities evidence the substantial yet exciting work ahead.

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12. Yet participants did highlight important lessons of the case: micro-information about land use is essential to designing macro programs; projects must respond to the priorities and interest of farmers; land users must participate in decisions concerning project design.

13. While neither video is of production quality, both provide visual representations of actual discussions. Copies can be ordered from the Land Tenure Center, 1300 University Avenue, University of Wisconsin, Madison, Wisconsin 53706.

POSTSCRIPT

As mentioned earlier, the narrative sections and the worksheets of the Harvard and the FSR/E gender-analysis frameworks establish some of the fundamental theoretical reasons for including gender as a socioeconomic component into the design and implementation of research and development programs. However, these two frameworks do not represent the only training approaches available for those interested in gender issues. Several trainers/scholars have taken steps in other directions, challenging the mainstream research and development process.[14] Many of these scholars call for by-passing the conventional research and development processes—for moving beyond mere inclusion of gender variables in ongoing research programs—to reconstruct and transform current theories and methods themselves. It is not within the scope of these introductory remarks to delve more deeply into a description of this approach.

It is our hope that these comments will benefit those interested in using the gender analysis framework and case study training method. Our challenge will be, of course, to deal with the suggestions raised in our future applications of the framework to tenure research. In the process, it is also hoped that the value of the framework as an analytical tool will be strengthened and greater understanding of tenure systems will be achieved.

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14. The following references will provide a starting point for those interested in these new directions: C. Moser, "Gender Planning in the Third World: Meeting Practical and Strategic Gender Needs," *World Development Report*, 17 (1989): 1799-1875; and C. Levy, "Gender Planning Theory and Methodology," Development Planning Unit Working Paper #11 (University College of London, 1985).

3 OCTOBER 1991

*** MORNING SESSIONS ***

OPENING COMMENTS

Dr. John W. Bruce, Director, Land Tenure Center
(as paraphrased by Nancy Sheehan)

On behalf of the Land Tenure Center, John Bruce welcomed guest speakers, Land Tenure Center staff, University of Wisconsin faculty and students. Bruce then highlighted two objectives of the workshop:

(1) to gain a better understanding of the systematic methods available for analyzing gender issues in tenure research; and

(2) to delineate particular areas which would require specific gender and resource tenure research.

Dr. Susana Lastarria, Land Tenure Center, Latin American and Caribbean Program
(excerpts from presentation)

Before we start today's sessions, I would like to give you an overview of this workshop—of the activities during these two days—to give you an idea of the Land Tenure Center's objectives in organizing this event.

The LTC has recognized for some time now that there is a need to consider and incorporate gender analysis in our research on access to resources, management of resources, and agricultural production. Just as it is accepted that persons and groups have dissimilar access to resources and behave differently because of class status, age, family life-cycle stage, and culture, among other factors, the LTC realizes that gender can also be a crucial factor in resource access.

Once having acknowledged the importance of gender in the analysis of resource tenure, however, there are still many questions to be addressed:

- When is gender analysis necessary?

- What are the issues in tenure resource research that should incorporate gender?
- How can past and present gender analysis results help us explore new approaches to resource tenure questions?
- How has gender analysis redefined research paradigms, and how can it help us reformulate and rethink our research questions?
- How is gender analysis done? Methodologically, how is gender incorporated into resource tenure research?
- What are the policy implications of gender analysis?

These are some of the questions that will be addressed during these two days of workshop activity. We do not pretend to be able to find definitive answers to all of them, but we do hope to explore such questions and perhaps rephrase a few of them so as to guide our research programs. And we are hoping that the experience of all of you will help us in our examination.

Despite the size of the workshop, our intention is to make it a participatory event. As you will notice on the agenda, there are several plenary and small group sessions scheduled. The general intent of the small group sessions is to provide you with the time necessary to discuss the issues raised and to use the analytical tools introduced during the more formal presentations.

SESSION ONE: HISTORICAL REVIEW OF GENDER ANALYSIS AND INTRODUCTION TO ANALYTICAL FRAMEWORKS

Dr. Kathleen Cloud, Workshop Facilitator; Director, Office of Women in International Development, University of Illinois, Urbana
(as paraphrased by Nancy Sheehan)

Kate Cloud began her discussion of the gender analysis framework with a retrospective look at the field of inquiry called "women in development" (WID).

In *Women's Role in Economic Development*,[1] Ester Boserup refuted the myth that benefits from development projects and programs were necessarily shared equally by men and

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1. Ester Boserup, *Women's Role in Economic Development* (New York: St. Martin's Press, 1970).

women. By detailing how women were adversely affected by agricultural innovations, Boserup provided evidence that the myth did not match reality. Many development programs have placed (and continue to place) women at a disadvantage vis-à-vis men.

In order to ameliorate inequalities either augmented or created by development projects, Boserup and other contemporary researchers argued that agricultural projects needed to address the priorities of women farmers. Initiatives were undertaken to promote greater equity among recipients of development assistance. The literature of this time period reflects this equity concern and women are often portrayed as victims of the development process.

As scholars and development practitioners gained greater insights into the complexity of agricultural enterprises, they began to put more emphasis on the productive and reproductive roles of women in society, roles which contributed to the development processes. Indeed, these post-Boserup researchers called for greater understanding of what became known as farming systems, those intricate systems which relied on the actions and interactions of men, women, and children. Thus, efficiency reasons were brought to the fore. By addressing the needs and priorities of women farmers, it was argued, farming systems could be made more efficient and productivity could be increased.

Some of these scholars found that research reports were not enough. Instead, they designed specific training programs to demonstrate that successful (agricultural) development relied on assisting women (as well as men) to carry out farming activities. The first formal training module of this type was created at the Harvard Institute for International Development: Jim Austin, Mary Anderson, Catherine Overholt, and Kate Cloud, responding to a request of the World Bank, formulated an analytical framework which synthesized the complexities of the equity/efficiency arguments into a few overarching issues. The outcome of their efforts was the book, *Gender Roles in Development Projects*.[2] The basic principles of the Harvard framework include:

(1) Activities analysis (who does what);

(2) Access to and control of analysis (who has what);

(3) Incentives analysis (who wants what);

(4) Influencing factors analysis (what factors influence the system and the individuals);

(5) Intervention analysis (what is the nature of the intervention and how does it fit reality).

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2. Catherine Overholt, Mary Anderson, James Austin, and Kathleen Cloud, eds., *Gender Roles in Development Projects* (West Hartford, Conn: Kumarian Press, 1985).

The use of this framework and the case study method has spawned many of the training activities of today. Cloud mentioned three instances of outstanding bilateral and multilateral donor cooperation:

- CIDA (Canadian International Development Agency) launched a gender analysis training program at the behest of the Asian Institute for Development in the Philippines;

- the London School of Economics initiated a gender training program with a more "overtly feminist approach," that is, a program that highlighted the immediate needs of women as differentiated from those of men in addition to exploring how the current political, economic, and scientific structures were not designed to deal with the long-term needs and priorities of women;

- several Scandinavian donors have sponsored training programs in Peru.

Cloud stated that because these efforts to sensitize (or efforts of "convincement") have been successful, more and more people are now asking "how to" questions instead of asking: "Is gender analysis necessary?" The most apparent manifestation of this line of questioning is the plethora of training materials tailored to particular cultural contexts and/or disciplines. A conference was recently convened in Bergen, Norway, to assess the need for developing a systematic education program for gender analysis trainers and to collect existing training materials.[3] Follow-up meetings will be organized by the Royal Tropical Institute (Holland), the International Labour Organization (Turin), and the Association of Women in Development (Washington, DC).

The Farming Systems Research and Extension (FSR/E) gender-analysis framework is one example of a sectoral adaptation of the Harvard training module. As Cloud described, this framework is directed toward the implementation of development projects and has thus been used in training programs for extension professionals.

These introductory comments helped to ground current efforts in a historical context and to demonstrate the value of adapting what is learned during the workshop to the unique characteristics of resource tenure issues.

At this point Cloud proceeded to outline the day's activities, starting with a brief description of salient points of the first case study. She also provided some guidelines for reading the case study in terms of the gender analysis framework.

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3. Conference materials are available from the Office of Women in International Development, University of Illinois, Urbana.

SESSION TWO: SMALL GROUP WORKING SESSION AND PLENARY DISCUSSION OF FIRST CASE STUDY

Participants were given roughly 30 minutes to re-read the first case study; they then formed small groups for a half-hour of discussion. Afterwards, participants joined in a plenary session.

Participants were asked to glean information pertaining to the access to and control of resources and the gender division of labor. Two worksheets taken from the gender analysis framework were used to organize this information during the plenary session. Tables 1 and 2 illustrate the application of these two worksheet analyses. (This procedure was replicated for the second case study as well.) Participants were also asked to identify gaps in the information presented in the case study and to develop research priorities for filling these gaps. Table 3 provides an outline of the priorities identified by the participants during the plenary period.

TABLE 1

THE UPPER RIVER VALLEY AUTHORITY RESETTLEMENT PROJECT: A CASE STUDY

Application of the Access to and Control of Resources Worksheet :
"Who has access to what resources and how do individuals or groups attain access?"

	NEW FARMERS	CURRENT FARMERS	ADMINISTRATORS
LAND			
WATER			
FOREST			
LABOR Paid Not paid Voluntary			

TABLE 2

THE UPPER RIVER VALLEY AUTHORITY RESETTLEMENT PROJECT: A CASE STUDY

Application of the Activities Analysis Worksheet : "What are the activities?"

	NEW FARMERS	CURRENT FARMERS	ADMINIS-TRATORS
FARMING Paid labor Fuelwood sale Fuelwood selection Fuelwood gathering Other forest products			
REPRODUCTION/HOUSEHOLD PRODUCTION Cooking Cleaning Child care Food processing Health			
HOUSEHOLD STRUCTURE			
CULTURAL FABRIC/CONTEXT Authority structure Rituals			
EXTENSION COMPONENTS			
SMALL ENTERPRISE			

TABLE 3

RESEARCH PRIORITIES FOR PHASE II OF THE UPPER RIVER VALLEY AUTHORITY RESETTLEMENT PROJECT

FUNDAMENTAL RESEARCH QUESTIONS:

(1) How did the process of designing and implementing this project affect/determine the outcome?

(2) Did the process build on the existing strengths and weaknesses inherent in the traditional farming systems, especially those components which provided ecological sustainability of the farming system?

(3) Did the project process enhance or diminish the decision-making skills of the community members?

RESEARCH NEEDED IN ORDER TO ASCERTAIN:

(1) Why is there a disturbing paradox?

Although Phase I of the project has successfully increased average income levels, there is widespread malnutrition. Pose this paradox to the community members and ask them how they would explain and solve the problem.

(2) What forms of participation are included in the project?

Who will participate in activities receiving monetary rewards? Who will operate the agriculture-related machinery (a paid job)? Who will assume the horticultural tasks (e.g., gardening), the products of which are to supplement the Food-for-Work allotments? Who will make up the voluntary labor force?

(3) What is the division of labor and where will possible labor bottlenecks occur?

(4) What new skills are required by new demands and new agricultural systems (e.g., cooking with nontraditional ingredients)?

(5) How do intrahousehold relationships influence access to and control of resources, especially relationships between different ethnic groups?

(6) How is land allocated?

(7) Is there an extension program in place which can deal with the concerns of both men and women farmers (in terms of access to markets, crop storage, etc.)?

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*** AFTERNOON SESSIONS ***

SESSION THREE: REVIEW OF FSR/E ANALYTICAL FRAMEWORK

Dr. Kathleen Cloud, Workshop Facilitator; Director, Office of Women in International Development, University of Illinois, Urbana
(as paraphrased by Nancy Sheehan)

The second half of the first day was devoted to an analysis of the Kenya agroforestry case study. Kate Cloud explained that the FSR/E approach has the following three characteristics:

(1) smaller-scale projects with an intensive and longer-term focus;

(2) interactive workings among scientists, farmers, and extension professionals; and

(3) on-site location of project coordinators during intervention.

The approach is designed to help transform micro-level information to macro-level, national policymaking. FSR/E methodology provides a way of moving from what is learned at the local level to what can be done at the national level.

The gender analysis framework adapted by FSR/E is very similar to the Harvard module. However, the FSR/E framework requires scientists and extension professionals to examine explicitly the *criteria* used to include individuals and/or households in agricultural development projects or programs. Thus, the FSR/E framework possesses six analytical sections, concluding with an inclusion analysis.

SESSION FOUR: SMALL GROUP WORKING SESSION AND PLENARY DISCUSSION OF SECOND CASE STUDY

Participants were allotted half an hour to re-read the agroforestry case study and a full hour to discuss the case in small groups. The small groups then reconvened in a plenary session.

TABLE 4

AGROFORESTRY EXTENSION AND RESEARCH: A CASE STUDY FROM SIAYA DISTRICT, KENYA

Project Objectives and Project Players

PLAYERS: Agroforesters, CARE, Kenya government

NATIONAL GOVERNMENT OBJECTIVE:

- Improvement of rural conditions through tree planting

CARE OBJECTIVES:

- Provision of fuelwood to subsistence farmers
- Enabling farmers to control reforestation activities in their region
- Training extension professionals

SHARED OBJECTIVE:

- To learn to work together with common or disparate goals

APPROACH:

- Promote local capacities (i.e., training for extensionists)
- Meet the agroforestry preferences of farmers

  (CARE aligned its extension efforts to match the different agro-ecological niches within a household, a village, and a region.)

- Maintain flexibility in extension efforts

(continued)

- Work with already existing community groups

  (This strategy was particularly helpful in reaching women. For example, women may not express their opinions in the presence of men but will in a group of women. Thus, a woman may have greater ability to make decisions when surrounded by women. As a group, women may be able to determine tree species combinations for nurseries whereas as an individual, a woman may not have this ability within her home environment.)

- Value local knowledge and experience

  (Instead of adhering to the promotion of a standard "package," CARE extension professionals presented options to farmers. Farmers then chose the options which seemed to fit their own requirements.)

- Modeling and social learning

- Extension workers go to where the farmers work

- Try to work within customary tenure arrangements

  (Women, however, are at a disadvantage in this case. While the customary tenure rules are generally perceived by community members to be valid, in practice, adherence to these rules will often be discretionary. For example, men can appeal to statutory laws when their rights are constrained by decisions based on customary laws. Alternatively, women's tenure rights are increasingly founded on the tenuous good behavior and good manners of their husbands, fathers, uncles, and other male elders; women often do not have the option of appealing to statutory laws to uphold their rights to land.)

Cloud opened the plenary session by posing two questions: What were the project objectives? and Who were the project players? Later in the afternoon the case study was discussed in terms of the Activities Analysis and the Access to and Control of Analysis. Table 4 (previous page) and table 5 (below) illustrate how the facilitator organized the points raised by the workshop participants.

TABLE 5

AGROFORESTRY EXTENSION AND RESEARCH: A CASE STUDY FROM SIAYA DISTRICT, KENYA

Application of the Two Worksheets: Activities Profile and Analysis of Access to and Control of Resources

ACTIVITIES	WHO HAS ACCESS* (male/female)	WHO HAS CONTROL* (male/female)
Seeds		
Plants		
Watering		
First transplanting		
Thinning		
Second transplanting		
Pruning		
Fodder collection		
Lopping		

* The answers to these two questions are multidimensional, based on interlocking sets of use rights associated with different tree components and socioeconomic characteristics of individuals (age group, household seniority).

4 OCTOBER 1991

*** MORNING SESSIONS ***

SESSION ONE: PANEL DISCUSSION: INTRODUCTION BY PANEL MODERATOR

Dr. Michael Roth, Economist, Land Tenure Center
(as paraphrased by Nancy Sheehan)

To introduce the topic of methodological tools associated with gender analysis, Michael Roth posed the following question:

- How can we (LTC) improve research to include a gender component?

Roth presented a schematic to illustrate the linkages between institutions (aspects of land tenure structure) and performance indicators (measurements of "successful"/"beneficial" tenure systems). Roth labeled this schematic, the "generic tenure research model." This schematic is depicted in table 6 below.

Roth listed several research methods known, and therefore most extensively used, by LTC staff researchers to assess the linkages between tenure systems and performance indicators. These include:

(1) data intensive surveys (e.g., random sample surveys);

(2) extensive interviewing (of government officials and farmers);

(3) case studies;

(4) rapid rural appraisals.

Roth contrasted these methods with other research approaches that he most often associates with gender analysis studies:

(1) income/expenditure studies;

(2) time-flow studies;

(3) marketing surveys.

TABLE 6
THE GENERIC TENURE RESEARCH MODEL

INSTITUTIONS		PERFORMANCE INDICATORS
Land access	1.	Investment
Land rights	2.	Productivity
Land markets	3.	Resource concentration
Agrarian structure	4.	Wealth/income distribution
	5.	Fragmentation of landholdings
	6.	Sustainability of natural resource use
	7.	Marketed surplus
	8.	Land values/mortgageability
	9.	Tenure security
	10.	Land markets

With these broad categories of research methods in mind, Roth proceeded to discuss the units of analysis and specific objectives of surveys implemented by LTC staff researchers. These two characteristics of LTC surveys mentioned by Roth are found in table 7. Throughout his discussion, Roth emphasized that different dimensions of tenure arrangements will emerge depending upon the unit of analysis used. A second point which Roth emphasized was that research costs vary according to the unit of analysis. Roth observed that the costs of implementing a survey increase exponentially from the least costly unit, the household, to the most costly unit, the plot/field. Given the cost horizon (as illustrated in figure 1), Roth stressed the need to consider "economies of scale." For example, when the units of analysis for the survey are households, then information about individual titling becomes less important.

Before turning over the podium to the guest speakers, Roth posed two additional questions:

- What information can we obtain from different research approaches?
- Who benefits from this gathered information?

TABLE 7

SURVEY CHARACTERISTICS OF TENURE ARRANGEMENTS AND LINKAGES WITH PRODUCTION PERFORMANCE ITEMS

1. **UNITS OF ANALYSIS:**

   (Either all three units are combined in one survey or, more commonly, one of the three units is used exclusively in a survey.)

   a. Household level

      The unit of analysis most commonly used in LTC surveys is the household, where the respondents are usually the nominal "heads of household."

   b. Parcel level

   c. Plot/field level

2. **SURVEY QUESTIONS DESIGNED TO GATHER:**

   a. Household level

      - Demographic profile
      - Farm size
      - Assets
      - Employment/income sources
      - Marketed surplus
      - Input usage
      - Land rights

   b. Parcel level

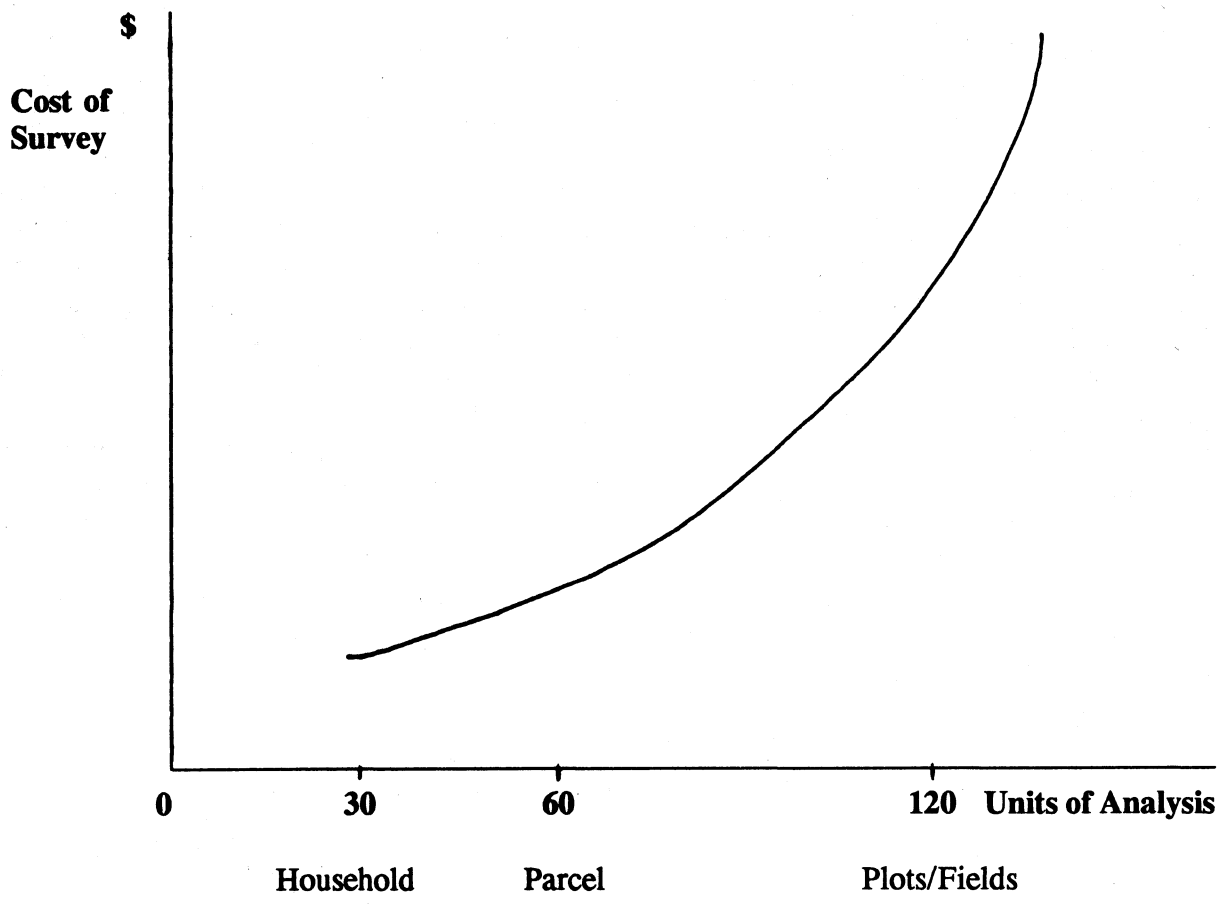
      - History of agricultural system
      - Investment
      - Land rights

   c. Plot/field level

      - Yields per unit of labor
      - Yields per land use
      - Land rights
      - Input use (including labor)

FIGURE 1

HYPOTHETICAL COST CURVE FOR CORRESPONDING UNITS OF ANALYSIS
(as presented by Michael Roth)



SESSION TWO: PANEL PRESENTATIONS: METHODOLOGICAL ISSUES OF GENDER ANALYSIS

Dr. Ruth Dixon-Mueller, Private Consultant
(as paraphrased by Nancy Sheehan)

Ruth Dixon-Mueller began by relating the story behind the publication of her book, *Women and Agricultural Labor.*[4] Writing this book, she said, illustrated many of the problems inherent in doing cross-cultural, comparative gender research. This particular book was to be the "definitive" reference on numbers and percentages of women in the agricultural labor forces of Latin America, Africa, and Asia. As Dixon-Mueller began to analyze various data sources (population censuses, national labor force surveys, ILO labor force estimates, local farm surveys, local time-use surveys, agricultural censuses, ethnographic materials, and so on), she quickly realized that a comparison of data was not going to be easy. Different survey methods with different questions and different definitions of what constituted labor led quickly to different stories about what women did and about the total size of the agricultural labor force. The fact that the various surveys did not disaggregate information by gender added another issue—converting man-days from woman-days and child-days involved problematic assumptions. Furthermore, the agricultural surveys at that time did not collect labor information on the landholding, specifically, information about the temporary or migrant labor force. So instead of writing a reference book, Dixon-Mueller wrote a book on the systematic biases found in surveys of the agricultural labor force.

Following this account, Dixon-Mueller outlined briefly the main topics described in her book, after which she drew some analogies to land tenure research currently undertaken by LTC. The two main analogies were:

- surveys are not disaggregating data by gender, and therefore the question of who has rights to what is not being answered; and

- biases might be present in differing definitions of tenure and differing measurements of productivity as related to tenure arrangements.

If the goal is to measure the relationship between tenure arrangements (particularly tenure security) and productivity (and thus the effect of long-term investments in sustainable agricultural practices), one of the crucial inputs into an agricultural system is the *labor* of men, women, and children.

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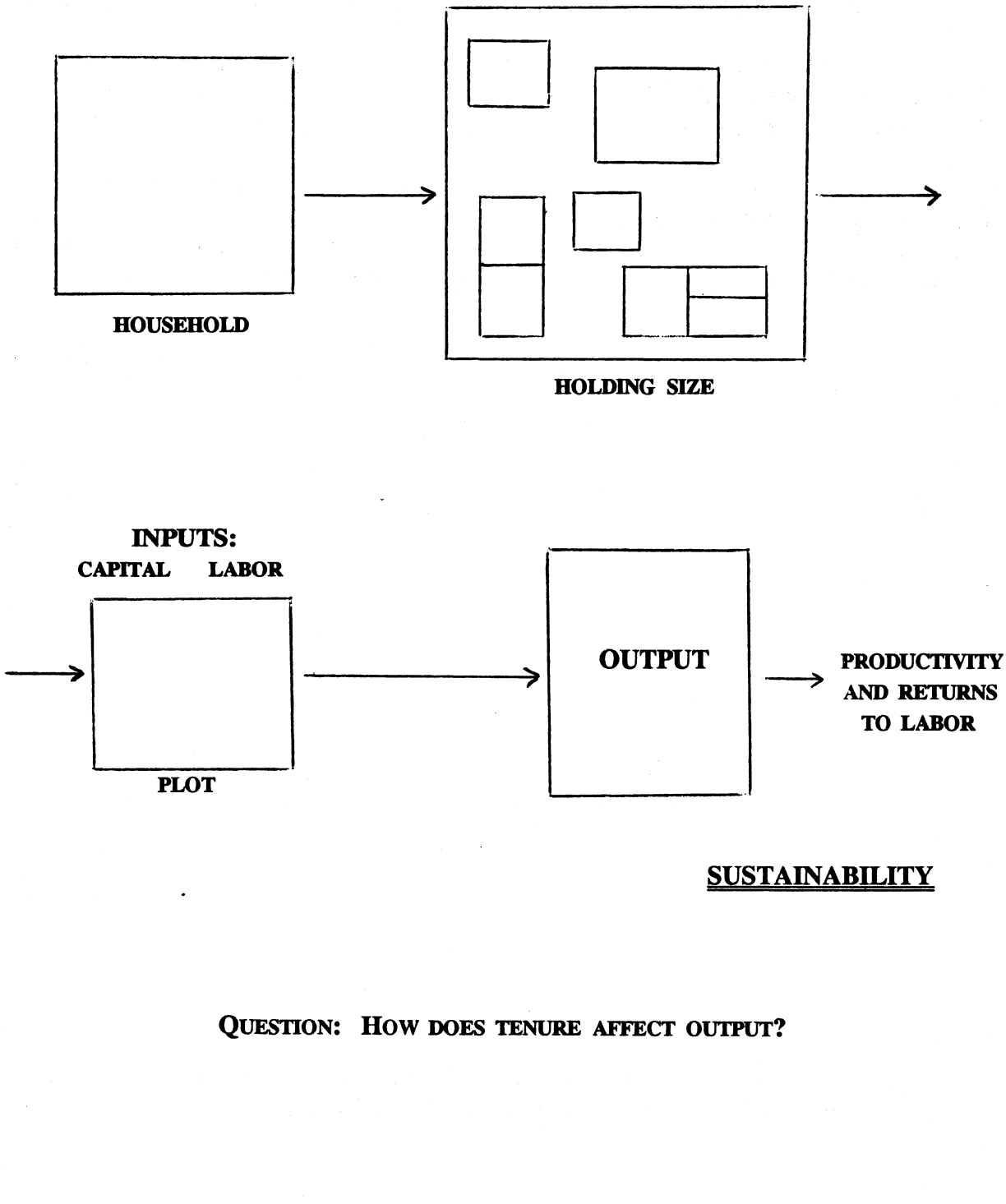
4. Ruth Dixon-Mueller, *Women and Agricultural Labor: Counting the Labor Force in Developing Countries* (New York: Population Council, 1982).

FIGURE 2

EFFECT OF TENURE ON AGRICULTURAL OUTPUTS WITH INTERVENING VARIABLES OF LABOR AND CAPITAL



QUESTION: HOW DOES TENURE AFFECT OUTPUT?

Thus Dixon-Mueller concluded that one of the fundamental missing links in LTC tenure research to date is the recognition and valuation of the different forms of labor which make a farming system productive or unproductive. She presented a schematic illustration of this fundamental link (see figure 2).

Dixon-Mueller stressed that "generic tenure models" *conceal* rather than *reveal* the complex variables which shape tenure arrangements over time and space. She then stated that the issue is not whether we can *afford* to consider gender but whether we can afford *not* to.

Concerning the cost of implementing surveys which disaggregate by gender, Dixon-Mueller recommended a flexible approach that included a combination of methods—not an exclusive reliance on large (and expensive) random sample surveys.

Dixon-Mueller related the findings of a study carried out by Anker et al.[5] to answer two considerations posed earlier by Roth and other LTC staff—that is, what are the effects of question wording and interviewer characteristics. Tables 8, 9, and 10 outline the design and results of the Anker et al. study; table 11 presents a summary of treatment effects.

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5. Richard Anker, M.E. Khan, and R.B. Gupta, "Biases in Measuring the Labour Force: Results of a Methods Test Survey in Uttar Pradesh, India," *International Labour Review* 126 (1987): 151-67.

TABLE 8

TEST OF BIASES IN MEASURING THE FEMALE LABOR FORCE
(calculating economic activity rates of women ages 15 to 59)

Authors:	Richard Anker, M.E. Khan, R.B. Gupta
Location:	State of Uttar Pradesh, India
Sample:	60 households each in a stratified sample of 27 villages: total of 1,621 households interviewed
Research design:	Random allocation of eight "treatments" ▸ Two types of questionnaire: simplified time/activity schedule versus "key word" questions (see table 9) ▸ Two types of interviewer (male versus female) ▸ Two types of respondent (woman versus proxy, usually male)
Question:	What effects do these treatments have on the reported female labor-force activity rates (three definitions)?
Labor force definitions:	1. Paid labor force: any work for wage or salary in cash or kind 2. Market labor force: plus any activity in a family enterprise that sells some or all of its products or services 3. New standard labor force (ILO definition): plus any activity whose products or services should be included according to systems of national accounts
Question:	What effect does the definition have on outcomes? (see table 10)

TABLE 9

TWO TYPES OF QUESTIONNAIRES USED IN ANKER ET AL. STUDY

1. "NESTED" KEY WORDS

Q1 Main activity in past season?

Q2 Secondary activity (next most important) in past season?

Q3 Any other work for earnings in past season?

Q4 Any other work for which family income was earned, such as helping out on a family farm or in a family business or some other activity?

Q5 Helped family by caring for livestock, processing food for storage, cooking for hired hands, sewing clothes, gathering fuel, etc?

2. SIMPLIFIED TIME/ACTIVITY QUESTIONNAIRE

For each activity listed:

Q1 Done at all in the past 12 months?

Q2 Time spent in last season:
a. Hours per day when done (fraction of day; 5 categories)
b. Days per season (frequency; 5 categories)

Q3 Done for family or other or both?

Q4 Received wage or salary?

Q5 Sold products or services (5 categories of fractions sold)?

TABLE 10

CLASSIFICATION OF ACTIVITIES ACCORDING TO LABOR FORCE DEFINITION
(from Anker et al. study)

	ACTIVITY	PAID LABOR FORCE	MARKET LABOR FORCE	NEW ILO
1.	Farming for wage or salary	yes	yes	yes
2.	Off-farm work for wage or salary	yes	yes	yes
3.	Weaving, sewing, crafts	yes (if wage/salary)	yes (if sold)	yes
4.	Other cash earnings	yes	yes (if wage/salary)	yes
5.	Family business, trade	no	yes	yes
6.	Self-employed	no	yes	yes
7.	Family farming/livestock	no	yes	yes (if sold)
8.	Crop/food processing/ storage	no	yes	yes (if sold)
9.	Gathering wild foods and fuelwood	no	yes	yes (if sold)
	PERCENTAGE OF WOMEN IN LABOR FORCE			
A.	Key words			
	Q 1 only	3%	7%	16%
	Q 1-3	10%	24%	48%
	Q 1-5	11%	34%	88%
B.	Time/activity schedule	13%	32%	88%

TABLE 11

COMPARISON OF TREATMENT EFFECTS AND AUTHOR'S CONCLUSIONS (from Anker et al. study)

TREATMENT EFFECTS

A. Key word versus time/activity schedule:

- Time/activity schedule takes longer but produces details, e.g., worked less than minimum time, part-time, full-time.

- Three key-word questions needed for the results for paid labor force

- Four key-word questions needed for market labor force

- Five key-word questions needed for ILO standard labor force

B. Male versus female interviewers:

- Differences were slight in magnitude, though often statistically significant.

- Males generally elicited higher results on activity schedule (asking specific questions); females, on key words (with more general inquiries).

C. Identity of respondent;

- Proxy respondents consistently reported fewer hours of work than did women themselves on the time/activity schedule.

- But there were no significant differences between two types of respondents in overall reports of labor force activity.

AUTHOR'S CONCLUSIONS

1. Male respondents and interviewers were not the chief villains in the underestimation of women's labor force.

2. Questionnaire design had a radical effect on outcomes.

Dr. Dianne Rocheleau, Assistant Professor, Department of Geography, Clark University
(as paraphrased by Nancy Sheehan)

Dianne Rocheleau opened by stating that the ecological context is as important as the social and legal contexts. Notions of tenure are usually delineated by an individual's or community's *control* over a resource. However, an individual's and/or community's functional and cultural use of resources equally define notions of tenure. Therefore, understanding land tenure systems must include an understanding of land use and natural resource management practices.

This fundamental point leads to critical questions: What is considered *real* land use? Does land use include a person's gathering products from the forests without leaving a readily visible sign behind? Likewise, does land use include the farmer's plowing his field, leaving the very visible plow print on the land?

Multiple uses of a broad range of ecological resources exist in reality. However, research has focused too often on single uses of land while ignoring the uses of other resources within the complete watershed or bio-geographical area. To understand the multiple uses of ecological resources, it is necessary to modulate the resolution of research to the "N" dimensional space. A two-dimensional perspective of land use will miss multiple and overlapping exploitations of land.

With this reality in mind, Rocheleau asked the audience to think again of Roth's discussion of the units of analysis commonly used by LTC researchers—household holding, parcel, and plot/field. In dissecting the environment into *only* these dimensions, much information will be lost, particularly the use of those resources which fall between these neatly divided land spaces. In fact, women are active resource managers of interstitial spaces.

Rocheleau illustrated the reality of land use in these interstitial spaces with an example of mapping people's use of land in Machakos District in Kenya. As part of a Kenyan alley farming project, a team of ICRAF (International Council for Research in Agroforestry) researchers and farmers began a three-dimensional mapping of the different uses of and patterns of access to resources. Resources included plots, pastures, cropland, hedgerows, woodlands, and the like. What emerged from these three-dimensional pictures were the resource use patterns of women. Hedgerows, for instance, were viewed by male members of the community as only boundary markers (that is, "no man's land," in the words of one male farmer). However, women actively managed the sisal found in these hedgerow spaces for the production of fiber. To have introduced another planting regime in the boundary areas would have resulted in women's losing an important source of income.

What is needed, then, is not only a *functional* narrative of land use patterns but also a *spatial* description of land use over time. Rocheleau recommended using several different kinds of information collection and exchange methods. In particular, she described focus groups and transect mapping. Both of these methods help to distinguish land use practices

which are complementary, oppositional, and/or supplementary. The dialogue and information exchange which take place during focus group discussions will help to indicate dispute areas and future projections of land use practices.

In closing, Rocheleau stressed the need for a reversal of the conventional research and development process. Understanding land use patterns must not be seen as the exclusive domain of researchers and technicians, for extension professionals and local residents possess as great or greater knowledge about their own land use systems. Rocheleau concluded by stressing that micro-level information can indeed be used to inform macro-level policies or project programming.

Dr. Cherub Antwi-Nsiah, Assistant Director, Office of Women in International Development, University of Illinois, Urbana

(Dr. Antwi-Nsiah has provided a detailed report of her research in Ghana, which is reproduced in appendix I.)

Dr. David Stanfield, Latin American and Caribbean Region, Land Tenure Center
(as paraphrased by Nancy Sheehan)

Dr. Stanfield posed two important questions to the audience:

- How and by whom are notions of landed property defined?
- How and by whom are notions of land rights defined?

As has often been the case in Latin America, the users of land define property and rights differently from those who are legally responsible for codifying land rights. For example, in a squatters' settlement in Honduras, women were found to be the primary income earners for 50 percent of the households. However, only 30 percent of the women received titles to the property they occupied. Subsequent to this finding, a publicity campaign was launched which encouraged women to view their contributions to household production and reproduction as valued work worthy of recognition by land titles.

Often legal systems neither correspond to patterns of land use and perceptions of landownership nor match the political will to promote equality. During recent LTC work in St. Lucia, researchers found that the government insisted that both men and women be interviewed in order to fully assess the impact of land reform on farmers. However, political rhetoric was not manifest in the land laws. LTC researchers found, for example, that unions not sanctified by a marriage certificate were not recognized in the land adjudication process; joint titling was not permitted for unmarried couples who lived together.

Problems of insecurity of landownership and unequal distribution of land are fundamentally social and political issues (and thus not exclusively legal). The people of Latin America have had a long tradition of political awareness. There have been numerous grass-roots political movements lobbying for more equitable distribution of land. Dr. Stanfield stated that the primary condition for successful lobbying efforts has been the creation of horizontal linkages between groups, unions, and associations within a country and throughout a region.

Dr. Stanfield described one important methodology for creating these linkages—use of video recorders. Grass-roots groups in Ecuador and Mexico, he said, are producing videos about their lives. The uniqueness of these activities is that the video machines were placed in the hands of the poor themselves. The films thus portray how the poor perceive themselves and their own reality. As a result, these videos show that women are active political leaders in lobbying for land reform. Stanfield did add a cautionary note, however. Such videos and films (documentaries) can pose threats to wealthier and politically powerful elites. The videos, therefore, must not be used by individuals but by groups, which can afford collective protection to individual members.

SESSION THREE: QUESTION AND RESPONSE PERIOD

The questions from workshop participants can be grouped into two categories:

- When is gender analysis important?
- How can it be done?

To answer the first question, Dixon-Mueller expressed the importance of preliminary research in exploring where gender fits into the survey question. However, she stressed that the research process needs to be iterative. Sequential feedback loops should be built into programs so that the details of life can indeed determine survey questions. Flexibility to reformulate the survey question is crucial in order to avoid a gender bias in what is counted as important research.

Stanfield substantiated this point by stating that the definition of landholdings included on agricultural censuses can be politically derived to favor large, politically powerful landholders. Underlying political meanings are important when assessing what is reported and what is not reported.

If cost is an important consideration, Rocheleau suggested that a smaller sample with accompanying observation might provide more accurate and thus more useful information than a large survey which does not provide information on women's access to and control of resources. Roth supported this notion by saying that choosing a subsample for a case study

analysis would be useful to verify and enrich the findings derived from a large survey. He admitted, however, that LTC has "not done a good job of this." Cherub remarked that she conducted unstructured interviews with 10 percent of her household sample.

To answer the second question, several panelists again mentioned the usefulness of multiple and iterative research methods. In particular, Rocheleau recommended working with existing social groupings, learning from the discourse taking place in public forums, and following people to the locus of their activities (for example, the field, the kitchen, and so on). Dixon-Mueller mentioned that interdisciplinary teams can elicit gender information perhaps better than a "one-man research show."

4 OCTOBER 1991

*** AFTERNOON SESSION ***

SESSION FOUR: RESEARCH GUIDELINES AND POLICY IMPLICATIONS

Dr. Marion Brown, Moderator; Chairperson, Department of Agricultural Journalism, University of Wisconsin-Madison

(This section does not recount in detail the interesting interchange of suggestions and questions posed during this session of the workshop. Rather, it represents a synthesis of the most salient points redefined in terms of research guidelines. The objective was to create an easily accessible reference.)

▸ Is land the only focus of research? ◂

Historically, land has been the main focus of LTC research endeavors. However, with information garnered during the workshop and more recent LTC investigations, many LTC researchers noted that land, in essence, needs to be contextualized back into the landscape. Notions of land tenure encompass the totality of natural resources in an ecosystem, including land, trees, water, and so forth. For example, recent research by Rebecca McLain[6] moved from an exclusive focus on agricultural farming systems to a concentration on multiple natural resource endowments which contribute to the survival of families and individuals.

▸ When is gender analysis appropriate? ◂

LTC researchers agreed that gender differences in access to and control of resources need to be deliberately incorporated in survey research. Two types of future research endeavors were envisioned:

- research that is not gender specific but disaggregates by gender; and
- research that is gender specific and focuses exclusively on women.

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6. Rebecca McLain, "Tenure, Tree Management, and Mali's Forest Code: Report of a Sample Survey in Central Mali" (Madison: Land Tenure Center, University of Wisconsin, March 1991); "Tenure and Agroforestry: Village and Household Studies in Central Mali" (Madison: Land Tenure Center, University of Wisconsin, October 1990); "Tenure and Tree Management on the Dogon Plateau: Three Case Studies in Bandiagara, Mali" (Madison: Land Tenure Center, University of Wisconsin, March 1990). All three studies, trimesterly reports from a village reforestation project, are also available in French.

In either case, LTC staff acknowledged the importance of preliminary, exploratory research in order to distinguish gender differences before a larger survey is carried out. LTC staff mentioned several potential gender-specific research topics:

- alley farming;
- women's resources and activities (for example, water, fuelwood, gardens);
- inheritance rights.

▸ How is LTC to carry out gender analysis? ◂

A concerted effort must be made to ascertain what women themselves perceive as resources. Cloud, for example, described the value that Indian women place on wild grasses which an "outsider" would consider weeds. Different forms of communication, language patterns, and world views may confound these efforts (for example, outsiders may not be able to recognize the value that local people invest in particular resources). It was suggested that only over an extended period of time can mutual understanding be achieved among the researchers and the researched.

In addition to enjoying longer research periods, approaching tenure issues from a land user's perspective (a recommendation introduced by Rocheleau) would help to get beyond these missed communications and biased perceptions. For example, Rocheleau mentioned that discussions held with focus groups of land users helped to distinguish the "nested rights" of men, women, and children to available resources.

Bruce suggested that the "bundle of rights" concept might be useful in distinguishing individuals' differing access to and control of different types of resources.

The fundamental recommendations were:

- be flexible and imaginative;
- undertake exploratory field work (perhaps rapid rural appraisals);
- incorporate ethnographic and landscape mapping methods; and
- use multiple research methods—community radio programs, videos, focus groups, open-ended questions.

Rocheleau provided a concluding comment: the diversity found to be inherent in ecosystems and societies should be matched with equally diverse research methods. For example, one could stratify a study based on the complexity of the socio-ecological system itself.

▸ What are the most pressing research priorities? ◂

The numerous suggestions included:

- the potential of co-registration programs to protect women's rights to resources in the occurrence of the death of or divorce/separation from their husbands;
- the impact of greater privatization of landownership on women;
- the institutional consequences of decentralization (a recommendation of structural adjustment programs);
- the potential for micro-level information on tenure arrangements being encoded into national laws;
- the dynamic nature of customary tenure systems and the reinterpretation of tenure arrangements under new ecological and legal regimes;
- the study of how customary tenure systems do, or do not, protect women's rights of access and control; and
- the formal and informal dispute settlement process.

GENDER AND NATURAL RESOURCE TENURE RESEARCH

APPENDIX I

Presentation :

Women's Access to Property in Ghana

by

Dr. Cherub Antwi-Nsiah

This dissertation examines gender inequalities at the household level and how these relate to overall national development. The dissertation has two main objectives. The first is to develop a methodology for research that will provide information on structures and processes at the household level that influence the status of women and generate gender inequalities. This methodology addresses the activity patterns of males and females and intrahousehold dynamics relating to the division of labor and allocation of resources. It also addresses the sociocultural system, laws, and legislation which directly and indirectly affect the status of women.

The second objective was to examine education and property. It was proposed that institutionalized differences in access to formal education and property are two of the most important mechanisms influencing gender inequalities in activity patterns, income distribution, access to and control over resources, and opportunities.

Although the total data set is based on a survey of 1600 households due to time constraints the dissertation analysis focused on a smaller set of questions. Data for these analyses were based on subsets of the total data set. The objective of this research, which is the main objective of the thesis is to examine education and property, which are proposed as two of the most important resources affecting the situation of women. The theoretical argument developed is that institutionalized differences in access to formal education and property are two of the most important mechanisms influencing gender inequalities at the household level:

- **Education** -- the acquisition of general knowledge or special skills -- is an indicator of the development potential of the population and the status of women in the society. Access to other opportunities and resources depends to a large extent on access to formal education, and ultimately, the level of education attained.
- **Property** -- which may include tangibles and intangibles but is limited to physical resources in this study -- is seen as the legal construction of the economic element in a husband and wife relationship. Property constrains men and women to act as different subjects (Whitehead 1984). Relationships between men and women are structured by access to, control of, and transmission of property. Property rights and relations confer power and status on men and women differentially. Differential access to property influences status and gives rise to inequalities in access to capital and credit.

Three subsets of data from the total data set were used for the dissertation. Data for the analysis of levels of education attained was based on a subset of 1177 individuals in 228 households. Analysis of educational participation was based on data on 1382 individuals collected at the locality level. Data on a subset of 204 households were used for the property analysis.

A focus on formal education and property allows the research to examine both the structural and power dimensions of gender relations. The overall objective is to observe the linkages and interactions between these two dimensions of gender relations: how they influence the division of labor and gender-related access to and control over resources and benefits and how they confer power and status on women.

This dissertation links household research to macroeconomic policy analysis. It departs from previous studies on the effects of the processes of capitalist economic development by focusing on the indirect mechanisms which generate and reinforce gender inequalities in activity patterns, income distribution, access to, and control over resources and opportunities. It highlights how societal inequalities are manifested at the household level.

Although the focus is on gender inequalities, it is contended that interpersonal inequalities based upon gender cannot and should not be treated separately from class-based and region-based inequalities. The three critical dimensions of human society -- gender, class, and region -- are inextricably intertwined, and the dependency relations and attendant inequalities arising along these three dimensions are mutually reinforcing.

1) What are local perceptions of class and the corresponding occupations for males and females for each class in different regions?
2) What are local perceptions of status and well-being as well as of inequalities in the levels of well-being between males and females?
3) How has social and technological change affected gender relations in the household and intrahousehold dynamics? More specifically, how do micro (household) forces respond to macro (national) changes, and how do these two forces interact to generate and perpetuate gender inequalities?

The working hypothesis drawn from this work is that significant gender inequalities do exist in the Ghanaian space economy and that these inequalities are reinforced by class-based and region-based inequalities.

Furthermore, it is hypothesized that institutionalized differences in access to formal education and property are two of the most important mechanisms influencing the situation of women at the household and national levels. These structures and mechanisms influence activity patterns, access to and control of resources, opportunities, and benefits; and determine the status of women. More specifically, it is hypothesized that:

1) Males and females have differential access to formal education;
2) Household duties act as constraints to female participation in education;
3) Lack of perceived and/or real economic returns to women's education also constrain women's participation in education;
4) Traditional views about girls' education constrain female participation in education;
5) Males and females have differential access to property caused by an interaction between traditional rules governing property and current laws and government policies;
6) Differential access to property generates inequalities between men and women of the same class and region; and
7) Women make choices in situations with enormous resource restrictions. They allocate resources strategically to make rational investments in the next generation.

Chapter 4 outlines the methodology for the total study. It discusses the objectives guiding the development of hypotheses -- what the researcher thinks is likely to be the situation in Ghana -- and overall methodology; the approach for the study; the survey method and its rationale; the sampling method; the survey instrument and it elements; the sampling design; and the data gathering process. The total data set is based on a survey of 1600 households due to time constraints the dissertation analysis focused on a smaller set of questions. Data for these analyses were based on subsets of the total data set. Three subsets of data from the total data set were used for the dissertation. Data for the analysis of levels of education attained was based on a subset of 1177 individuals in 228 households. Analysis of educational participation was based on data on 1382 individuals collected at the locality level. Data on a subset of 204 households were used for the property analysis.

The dissertation addresses both macrolevel attributes as well as microlevel dynamics. It seeks to provide detailed information at the household level on factors that give rise to gender inequalities in access to education and property. It also moves beyond the sample to test for observed differences across the sample. The dissertation draws data from both primary and secondary sources to make it possible to determine the structures and processes that influence gender inequalities in developing countries, while focusing on the indirect mechanisms that influence and determine the status of women at the household level.

A field survey was needed because existing official statistics include only activities that enter the market. Hence, information on subsistence activities (for example, domestic non-wage labor and in-kind production on the farm which is performed mostly by women) is excluded from national accounts. Official statistics also yield very little information on the quality and dynamics of relationships. Insights into the

underlying actions and motivations of actors, emotions, relationships, family patterns, and obligations cannot be statistically investigated and are best derived from descriptive data. Household studies are better able to capture the informal microlevel processes in a society than aggregate or macrolevel studies which have as much impact on formal productive activity (Anderson 1972).

The unit of observation for the field survey is the household; the unit of analysis, however, is the individual. This research adopts a functional definition of the term household. A household consists of people in a dwelling unit who pool and share resources, process food, and cook. Household members include family, non-relatives, lodgers and servants who cooperate in some common activity. The use of the concept household in this research is not limited to people who eat together or live in the same dwelling unit. It extends to those who once lived in that dwelling unit and are no longer living there but still maintain some functional ties with the people in the dwelling unit, be it the supply of seasonal labor, money, or childcare. Although all members of a household will not be living under the same roof, the questions are designed to cover those outside as well (see Block 2 of questionnaire). Likewise, it is not all inhabitants of a dwelling unit who form members of a household. All tenants who do not share in any household activity, e.g. cooking or pooling of some resource, are not household members[1].

The Survey Method

Data for the portion of the study relating to household dynamics was derived from a detailed questionnaire administered to 1,600 individuals stratified on the basis of gender, class, region, and sociocultural system.

Part 1

For the first part of the survey, respondents were asked about their household physical attributes -- housing quality and household property. This will be used as a measure of the standard of living of the household, i.e. not how much they earn but what they can afford. Other questions referred to household membership; mobility of household members; educational attainment and activities of school children to find out whether household activities act as a constraint to educational participation; sources of household income; intra-household dynamics related to decision making; the distribution of resources; and the division of labor. This included gender roles in decision making and the division of labor among household members; who has control over household income; property relations and the principal means of resource distribution; and property transfer in the household.

(WHY) This information will reveal gender differences in activity patterns, access to and control over income and property, and rights to resources. It will also give insights into the operation and dynamics of the various mechanisms generating inequalities not only between males and females but also those differentiating females and the processes through which these mechanisms are used.

The first part of the survey covered the first four blocks of the questionnaire (see Appendix 1 for questionnaire).

- Block 1: Household Physical Attributes Inventory
- Block 2: Household Membership
- Block 3: Household Activity
- Block 4: Household Property
- Block 5: Local Perception of Class and Correspondent Occupations
- Block 6: Pair-wise Comparison of Groups

Data were also collected on enrollment and attendance of school children by sex and level in school for one urban and three rural localities in both patrilineal and matrilineal regions for the 1987-88 academic year[2]. This section of the study will show whether there are gender differences in educational participation and the dimensions across which they vary. Together with the data on household activities, it will be used to test the hypothesis that household activities act as constraints to female participation

in education.

Questions in the first four blocks of the questionnaire were open-ended. The questions in the fifth and sixth blocks were both open- and close-ended questions.

Block 2: Household membership. This Block is on characteristics of household members: age[3], sex, relationship to informant; migration information -- where they were born, localities they have lived in, length of stay; occupation -- past and current, and estimates of sales for a season (non-wage/salary earners); education -- highest standard attained, where it was obtained, and reasons for stopping school; and membership in associations or clubs.

The definition of a "household" adopted for the dissertation extends household membership to include those who once lived in that dwelling unit and are no longer living there but who still contribute to household income in cash or in the form of goods and services. Two types of household members can be identified: the resident and non-resident household member. There may also be some people who have never lived in the dwelling unit and are not relatives but who contribute something to household income. Although this may be rare, since this dissertation is interested in all transfers of money, goods, and services from and to the household, a section on household non-member assistance was included in an attempt to capture all income flows to a household.

Part 1 - Resident Household members: This section of the questionnaire was on the demographic characteristics of those living in the dwelling unit who share in some common activity. Tenants were excluded.

Part 2 - Non-resident Household members: In addition to the basic demographic questions in part 1, questions were also asked on where they are living, how long they have been living there, what they are doing, where else they have lived, how often they come to visit and duration of stay; and on the type of assistance given to the household. Contributions were classified under monies--amount and purpose for which it was given-- gifts, assistance with children, agricultural tools, agricultural labor--field preparation, planting, weeding, harvesting, transportation and sales-- housework; and any other type of assistance. These categories cover the kinds of transfers and receipts that flow within and between Ghanaian households.

Part 3 - Household non-member assistance: This section covers those who have never lived in the dwelling unit and do not cooperate in any common activity but who still give some assistance to the household. They may be relatives or non-relatives. The supplementary questions were the same as those for part 2. For simplicity, the boundaries of the household were limited to residents within the country at the time of the interview.

Part 3 - Wage/Salary workers: This section is a supplement to the section on resident household members. More specific questions were asked of household members who went to work during the week to earn money. These include where they worked, mode of transportation to work, type of work, date of employment, how they acquired the training, whether it was all year round or seasonal, full-time or part-time, wage or salary, and other occupations.

Block 3: Household activity. This block covered the activity profile of the household and household decision making. It captures intra-household dynamics relating to decision making and the division of labor; this includes gender roles in decision making and the division of labor among household members--who has control over household income. It will reveal gender differences in activity patterns, who has access and control over income, and patterns of household decision-making power.

Part 1 - Activity profile: Twenty-eight activities were listed and questions asked concerning which household members did which activities, the time each person spent doing a particular activity, and whether those individuals did these activities always, most times, or sometimes. Additional information was sought on type of chores done by school children and when they did their chores on school days--before school, after school, either before or after school, or whether a particular chore was done twice a day: both before and after school. The information will show gender differences in activity profiles of

boys and girls. Together with information on attendance, it will be used to test the hypothesis that household activities act as constraints to educational participation of females. The rest of the questions in this section were on the mode of task assignment, whether it was by birth order, age, sex, or whether there was no set pattern. Where males and females had specific tasks in the household, respondents were asked to list the tasks designated for each sex.

Part 2 - Decision making: The questions in this section are on sources of household income, who controls household income, whether the household members cook and eat together, keep joint or separate budgets for the house and/or for business, responsibilities for household expenditure, and decisions concerning allocation of resources, employment, co-residence with kin, children's education and discipline, family size and birth control, and use of leisure time. It includes information on the role of the extended family--husband's and wife's families--in decision making.

Block 4: Household property and property transfer. Questions in this block will provide information on the household property, property relations and principal means of resource distribution, and property transfer within the household. It will reveal access to and control of property and rights to resources.

Part 1 - Property: Questions were asked on ownership of the dwelling unit and type of ownership; types of household property, whether house lots, houses, businesses, farms or fallow agricultural land; location; size; ownership; whether it is owned by the husband, wife, husband's family, wife's family, or other; if it was communal property, who had the right of usufruct, acquisition, mode of acquisition, source, and when acquired.

Part 2 - Transfer: The questions in this section were on the transfer of properties listed in part 1: who the property will be transferred to; relationship to the owner; why the property is being transferred to that particular individual: whether it is because it is the rule of the descent system, the person is part-owner, or other reasons. Information from parts 1 and 2 together will reveal changes in inter-generational transmission of resources.

Part 2

The second part of the survey was on local perception of class and correspondent occupations and a pair-wise comparison of groups. Data were collected on local (individual) perception of class and the correspondent occupations for each class in different regions and socioeconomic well-being as well as inequalities in the levels of well-being for the groups being studied (see Table 16).

Block 4: Local perception of class and correspondent occupations. Respondents were asked to specify occupations for each class by region.

Sample of questions:- A.1. What occupations do you think of for the following? (see Table 15)

B.1. What class do you belong to ?
Upper _____ Lower _____

B.2. What descent system do you belong to ?
Patrilineal _____ Matrilineal ____ Both ____ Neither ____

This information is needed because local perception might differ from official specifications. Local perception of class and occupations will reflect environmental and regional differences. This is important because it gives information on what is actually happening on the ground. Location differences will reflect opportunities available in a particular region, i.e. the demand for a particular type of labor--rural/urban, agricultural and non-agricultural. A lower class job in an urban area might be listed as a factory hand and a job of the same class in the rural area as peasant. In a coastal area, it might not be a peasant but a fisherman. Differences in occupations for classes in localities with characteristics and conditions will reflect local responses to economic situations.

The class of the individual may also have a bearing on how they perceive particular occupations. What constitutes a low class occupation to someone in a rural region may be entirely different from what an urban resident perceives as a low class occupation. Just as the economy is changing and

developing, so are occupations and classes expected to change. The responses given will reflect some of these dynamics not captured by standard census classifications.

Class of respondent: Although the household sample was stratified by gender, class, socioculture, and region, the respondents were asked to specify their class--a choice between upper and lower class. This section is to get information on individual perception of "well-being" or status and to test occupation as a measure of well-being. The information will reveal the individual's satisfaction with his occupational status.

As discussed in Block 1, "well-being" is not so much the amount one earns, which is based on occupation, but what one can afford. Occupational status comes with a certain level of income which is fixed for wage-salaried earners and variable for the self-employed and casual laborer. This income is supposed to be able to buy satisfaction or "well-being"; an individual should be able to purchase the goods and services that are commensurate with one's occupation and class.

In the Ghanaian situation using only occupation as a measure is not enough because of the extended family with its rights, duties, and obligations. An individual with a low occupational status but who receives remittances and has inherited property will perceive himself as being an upper class citizen although he is classified as being lower class because of his occupation. This individual is also likely to have another job. Multiple occupations are more true of the lower classes who have to do more than one job to make ends meet. The type of jobs they do may be "in-house" jobs which do not enter official accounts. A lower class person having other sources of income may be able to purchase the goods and services he or she needs, including durable household goods. Such an individual is likely to consider himself/herself as being middle class or even upper class.

In Ghana when people of the rural and urban lower classes (rather than the urban upper class) think of classes, they think of them in terms of whether the person is rich or poor--what he has, although individuals in certain occupations marked as upper class are assumed to be rich and others poor[4]. The urban-based upper classes do not use occupation as a measure of wealth and class; they think of it in terms of the goods and services that the person is able to afford. This is because the upper class person is aware and knows that the status and prestige that come with their occupations is not matched by a high purchasing power. The person's real or actual income is reduced. He or she may not be able to purchase the goods and services that go with his class and status. This individual's real income is also significantly reduced because of inflation. This individual may also have a wide network of kin he or she is remitting a significant proportion of his income to, in addition to other extended family obligations like contributions towards out-doorings, marriages and funerals[5]. Such an individual may not be deriving any satisfaction from his or her "assumed class" and may consider himself/herself as middle class or even lower class.

With this background, the questions were designed to find out what class the respondent thinks he/she belongs to, i.e. "how do you see yourself"? In addition to measuring satisfaction, this section questions the validity of using occupation as a measure of class in the Ghanaian context. It will be interesting to see the number and the characteristics of the lower and upper class individuals who perceive themselves as middle class, although that category was left out.

Sociocultural group of respondents: Respondents were asked to specify which descent system they belonged to. Sociocultural groupings have spatial boundaries. The sampling of the sociocultural system was based on that of the natives of a particular locality. This gave the expected descent systems. The purpose of this question is to distinguish the actual group of the respondent and not that expected according to stratification or by virtue of the respondent's location. For example, a migrant may belong to a different system from the one specified for the locality he or she is living in. Another example is a" bilateral" individual -- an individual with a father from a patrilineal kingship system and mother from a matrilineal kingship system. Because this individual traces descent from both parents, he or she will inherit from both systems[6]. On the other hand, someone whose mother is patrilineal and father is matrilineal is considered to have no descent group -- a classic case of a clash of cultures. This individual who does not trace descent from any of the parents may be living in a locality where descent is traced through

either of the parents. Therefore, by asking the respondent to provide this information, all biases and errors are eliminated.

Block 6: Pair-wise comparison of groups. Each respondent was also presented with two pairs of objects (an object being a combination of all categories of gender, class, sociocultural group, and region) and asked to compare performance on twenty-six attributes. All objects in the factorial universe, a combination of all categories of gender, class, region (urban and rural), and socio-cultural system (2 x 2 x 2 x 2) was used for the 1,600 respondents. The categories are shown in Table 17.

The sample, divided by all objects in the factorial universe yielded one hundred cases in each cell -- a cell being one of the sixteen combinations. For example, a male, upper class, patrilineal individual living in a rural locality of, for example, Jumapo, compared to a female, upper class, patrilineal individual also living in the Jumapo. For each pair, only one variable was changed: a comparison between two people of different sex, same class, same sociocultural system, and same region.

Part 3

The third part of the survey addressed the effect of social and technological change on the households. This was in the form of an unstructured interview: a conversation between the principal investigator and the respondent.

The respondents were asked about how certain historic events have affected them as individuals as well as their households. For example, they were asked about the effect of the introduction of cocoa crop production and the introduction of new production processes on the composition and the sexual division of the household. They were also asked about the effect of the economic crisis on the position of the household. The objective was to examine the response of microlevel to macrolevel changes, specifically how these interact to generate and perpetuate gender inequalities.

It is expected that while social change has created rewards and opportunities for certain groups, it has led to the marginalization of others; females relative to males have been adversely affected by social and technological change. This portion of the survey was administered to only a 10 percent of the sample from each locality. A total of 160 respondents were interviewed.

Part 4

The final part of the survey on enrollment and attendance in schools examines gender differences in educational participation at the local level. The data was collected by region, socioculture, gender, class level, and season.

The Sampling design. The unit of observation for the field survey is the household; the unit of analysis, however, is the individual. The households were chosen through a multi-stage, stratified, random sampling procedure. Such a random sampling framework, with the household as the unit of observation, already exists in Ghana at the census unit of the Statistical Services Division, Accra. This sampling framework was used with some modifications for defining the sample to be interviewed. Administrative regions were first stratified into ethnic regions, then into patrilineal and matrilineal sociocultural systems. Sociocultural systems roughly correspond to regional administrative boundaries with the exception of the Eastern Region and the Volta Region which has both matrilineal and patrilineal systems.

Secondary Sources

The second part of the research is on the legal and sociocultural framework -- institutions generating and perpetuating gender inequalities -- within which women operate. The focus is on laws, legislation, descent, and lineage systems which directly and indirectly affect women and the distribution of government facilities, specifically education facilities. Data for this part of the research is from secondary sources found both in U.S. library sources and in Ghana. The sources are government documents and reports and other reports and analyses.

Government Documents and Reports

These include national budgets, government employment figures, census data showing population distribution, household economic surveys, distribution of government services and facilities, specifically education facilities -- schools, non-formal educational programs (for example, numeracy-literacy programs and training) -- and legal documents.

Other Reports and Analyses

These sources include reports and case studies conducted by private scholars and researchers, universities, institutions, and international agencies -- United Nations publications, United States Agency for International Development, the World Bank, International Labor Organization -- on the legal and sociocultural framework and on the problem of gender inequality and economic development.

Implementation Issues

Choice of Region

For this dissertation, "region" is defined as urban and rural localities[7]. The Central Bureau of Statistics[8], the official data gathering machinery in Ghana, uses "size of settlement" to classify its localities. An "urban" locality is defined as any settlement with population between 5,000 and 20,000. Urban settlements with population above 20,000 are referred to as large urban centers or cities. Any settlement with population below 5,000 is considered rural (Central Bureau of Statists 1979). The Ghanaian census classifications have been adopted for this study.

Time and financial constraints made it impossible to administer a national survey. The sample of 1600 households was therefore drawn from one administrative region: the Eastern Region. The Eastern Region was chosen because of its heterogeneity. It is one of the two administrative regions in Ghana with both patrilineal and matrilineal descent systems within its boundaries (see Figure 1). The Eastern Region was chosen over the Volta Region because of its history. It was the region where cocoa was first introduced in the nineteenth century. The introduction of cocoa resulted in new production processes, new labor and household formations, changes in the gender relations of production, and a new division of labor[9]. Thus, the region has the longest history of structural change. The Eastern Region also has many ethnic groups as well as a large migrant population. The ethnic groups are shown in Table 20.

Fig. 8. Map of Eastern Region with Ghana Insert

Fig. 10. Map of Eastern Region showing the Eighteen Localities Surveyed.

TABLE 21. ETHNIC GROUPS IN THE EASTERN REGION

	Matrilineal
Adangbe	Kwahu
Kyerepon*	Akwapem
Larte*	Akyem
	Asante

Note: Kyerepon and Larte ethnic groups are also considered Akwapem, but are patrilineal. Akwapems in Aburi and Akropong localities are matrilineal.

The Eastern Region has an area of 19,323 sqkm. It is bounded by the Ashanti Region to the north, Greater Accra Region to the south, Volta Region to the east and the Western Region to the west (see Figure 8)[10]. In 1960, the Eastern Region's population was 25.5 percent of Ghana's total population.

By 1970, this figure had declined to 14.1 percent and further to 13.8 percent in 1984. The decline in population is due to two main factors: first, the division of the region into two administrative regions, the present Eastern Region and Greater Accra Region (see Figure 9). Second, the decline in cocoa prices which resulted in migration to other parts of Ghana and to other countries in West Africa. However, the decline in population was reversed in 1984. The growth rate of the Eastern Region from March 1970 to 1984 was 2.4. A 38.8 percent increase.

The Eastern Region today has a population of 1,679,483. The urban population is 448,777 (26.7 percent) and rural, 1,230,706 (73.3 percent). It is the second most urbanized region in Ghana, second only to the Greater Accra Region. In 1960, the percentage of the urban population was 20.2 percent. In 1970, it increased to 24.6 percent and to 26.7 percent in 1984. The population is 49 percent male and 51 percent female, the same as the national proportions. Between 1970 and 1984, there was an increase in the proportion of males in the region. In 1970, the population consisted of 599,595 males and 610,279 females. By 1984, it had increased to 831,683 males and 847,800 females. This increase is due largely to return migration from the cities and from outside Ghana[11].

Farming is the main occupation in the Eastern Region. In the large cities, there are various opportunities in the labor market. The towns and villages on the ***Akwapim*** Ridge, however, have very few income-earning opportunities. The decline of the cocoa industry on the Ridge has left the area extremely poor[12].

The Sample

The 1600 households were chosen from eighteen localities in the Eastern Region. A third (six) of them were urban and the remaining two-thirds (twelve) rural, to follow the national proportion (see Figure 10). The localities chosen take account of the heterogeneity of the region -- they represent all the tribal groups in the region. The number of respondents chosen from each locality was proportional to the population of the locality as shown in Tables 21 and 22.

TABLE 22. URBAN LOCALITIES: POPULATION AND SAMPLE SIZE

Locality	Population	Sample
Aburi	7,786	28
Koforidua	58,724	210
Larteh	8,275	30
Nkawkaw	30,000	107
Nsawam	31,994	114
Somanya	12,444	44
Total	149,223	533

Total urban sample = 533

$$\text{Sample Size for X} = \frac{\text{Population of X}}{\text{Total Urban Population}} \times \text{Total Urban Sample}$$

TABLE 23. RURAL LOCALITIES: POPULATION AND SAMPLE SIZE

Locality	Population	Sample
Abiriw	2,105	81
Ahwerease	572	22
Akwadum	2,624	101
Amanase	2,000	77
Amanokrom	1,819	70
Atibie	3,610	139
Jumapo	3,680	142
Nankese	3,014	116
Obomeng	1,636	63
Obosomase	1,662	64
Sawer	2,338	90
Sra	2,650	102
Total	27,710	1067

Total rural sample = 1067

$$\text{Sample Size for X} = \frac{\text{Population of X}}{\text{Total Rural Population}} \times \text{Total Rural Sample}$$

For example, sample size for Aburi

urban:

$$n = \frac{7{,}786}{149{,}223} \times 533$$

$$n = 28$$

sample size for Nankese

rural:

$$n = \frac{2{,}975}{27{,}710} \times 1067$$

$$n = 116$$

The Informant

Although information was required on every member of the household, only one person from each household was interviewed. The head of the household was chosen as the respondent. The occupation of this particular individual defines the class of the household. The Ghanaian census definition of class was adopted for the purpose of selecting the households. The head of the household was chosen as the respondent because he is the person most likely to have information on all the other members of the household. In Ghana, this particular individual is usually the oldest person in the household. Since part of the survey is on social change and historical data, it is important to interview the person most likely to have lived through historic events and changes in the society.

In the case of two or more households living in one dwelling unit, one of the households was randomly selected for the interview. In the rural localities, it was difficult to get the same number of

upper and lower class households because most upper class households are urban-based. In choosing the rural, households I tried to get as much representation from each class as possible.

An equal number of upper class and lower class households were selected from each of the localities, with the provision that 50 percent of the respondents from each strata be male and the other 50 percent, female[13]. In the urban localities, the sampling with replacement technique was adopted to get the same number of high and low class households. In the rural localities, it was not always possible to have enough high class residents. The households were chosen using the population interval with the goal of getting as much representation from each class as possible.

Gaining Access

Rural

In the rural areas, it was necessary to contact the chief, or ***Odikro,*** of the locality to inform him of my mission before starting the interviews. Ghanaian custom demands that one perform certain rites before gaining an audience with a chief. In each rural locality, I had to buy a bottle of schnapps (local gin). The size of the bottle depended on the status of the chief. Custom demanded 1 full-size bottle (about 1 litre) for a chief, and one small-size bottle, ***akôtoa,*** (about ½ litre) for a sub-chief. Through the ***okyeame***, the linguist or speaker for the chief, I briefly explained to him the purpose and objectives of the survey, impressing upon him that the information collected would be treated as confidential. Having satisfied himself that my mission was not of a dubious nature, the chief through the ***okyeame*** assured me of passing on the message to his subjects and asking for their cooperation. A fee of *₵200.00* (U.S. $0.57) was charged for ***dawuro***, or gong-gong beating. At dawn of the next day, the town crier beat his ***dawuro*** to inform the people of the survey and ask that they give us their full cooperation.

On one occasion, the day I was to be introduced to the chief in Amanokrom happened to be the day of the ***Akwasidae*** festival. I had been asked to leave my interviewer's manual for the chief to read through a few days before this[14]. My research assistants and I were introduced to the chief after normal "stool"[15] business was finished. We presented the survey and its objectives to the chief through the okyeame. The chief then explained to the people that it was just an academic exercise for writing a history book. He emphasized the importance of documenting historical events for the transfer of knowledge and customs to future generations. He asked them whether they would not be happy to know that they helped write history. The chief asked for the full cooperation of his subjects. He cautioned them that some of the questions would be sensitive and even irritating, and so they should have patience. He said, "If you have not had any food to eat the whole day and they come to ask you what kind of food you ate that day, please do not throw a knife at them."[16] This statement was received with much laughter by the people.

Urban

In the urban localities, it was not necessary to go to the chief since the areas were too large for the town crier to beat his ***dawuro***. In one large urban center, Koforidua, my research assistants and I went to the Ghana Broadcasting Corporation, where I was interviewed on one of their live local vernacular talk shows. We talked about the survey and the benefits which the citizens would derive from the dissemination of some of the findings of the survey. The announcer informed the listeners of the sections of the town to be covered by the survey, assured them of the confidentiality of their responses, and appealed to them to give the interviewers their full cooperation.

Choosing the houses[17]

1) Starting from the edge of the town, all the houses were listed on an outline map of the locality. This gave the number of houses in the locality.
2) The number of houses was divided by the sample size for the locality to get the interval).
3) Using this interval, the houses were selected.

In localities where the houses are numbered, each house number was regarded as identifying a

separate house or compound. However, in cases where two structurally separate houses bore the same number, they were regarded as two separate houses.

The houses were chosen by dividing the area into segments and selecting houses from each segment. For example, if the area is divided into four identifiable segments and the sample size is 32, using the interval, eight houses were chosen from each segment. In the large urban localities because of the size and congestion, any small area bounded on all sides by streets was regarded as a segment. The "serpentine" procedure used by the Census Office in Ghana was adopted for selecting the houses (Central Bureau of Statistics, 1979). Starting from one corner of the segment, all the dwelling units were listed, counting all houses on that street to the end. Another corner was taken until the whole segment was covered.

Administration of the questionnaire

Procedure

Each questionnaire took half a day to administer. Because of the level of detail required and the length of the questionnaire, the interview was divided into two parts. The first part covered household dynamics -- Blocks 1-4 of the questionnaire -- and the impact of social and technological change, if the respondent was part of the sub-sample. The second part of the interview was on the local perception of class, the correspondent occupations for each class in different regions, and a pair- wise comparison of groups along the society's attributes of status and well-being -- Blocks 5 and 6 of the questionnaire. If the respondent had to leave, Blocks 5 and 6 were left for another time. Block 6 took the same amount of time to administer as Blocks 1 - 5. The respondents were, however, encouraged to do the whole interview on the same day. The final part of the survey, on enrollment and attendance in schools, was collected at the locality level.

Use of translator. It was necessary to use the services of a translator in the ***Adangbe*** area of the Eastern Region because of a language barrier. All the other ethnic groups in the Eastern region -- ***Akwapem, Akyem, Asante, Kyerepon***, and ***Larte*** -- speak some dialect of ***Twi***, an umbrella language understood by the researcher[18].

The questionnaire was administered in the language the respondent was most comfortable with. For most of the respondents, especially those in the rural localities, the local language was used. In the urban localities, some people preferred the local language even though they were literate.

The interview was done in two stages. Blocks 1 - 4 of the questionnaire was administered first. If the respondent had to leave, the fifth block was left for another time. Block 5 took the same amount of time to administer as Blocks 1 - 4. The respondents were however encouraged to do the whole interview on the same day.

NOTES

1. The Central Bureau of Statistics, the official data gathering machinery in Ghana defines a household as, "... consisting of a person or a group of persons who share the same housekeeping arrangements and are catered for as one unit, usually residing in the same house/compound. Members of a household may not be necessarily related by blood or marriage." Central Bureau of Statistics (1979:14).

2. Data was first collected on enrollment and attendance of school children by sex for each of the eighteen communities for a month. The limitation was that it was difficult to see the trends because the survey did not cover all the seasons. Therefore, additional information was collected for a full school year.

3. A list of historical events that had taken place in Ghana from 1887 to 1981 was used to guide illiterates in estimating their ages. These people might not know their exact birth days but will remember events that they had been told happened just before or after their birth. They will also remember their age when a certain event occurred. From these, the age of an individual can be estimated. Events after 1981 were not listed because they are current and respondents are likely to remember them. The list of historical events is shown in Appendix 2, page ....

4. They use expressions like ***eye shika ee !*** , ***shika tse*** in Ga; and ***o wo sika o*** ! ***osikani***, in Twi. Translated as, "he/she is very rich ***ee/o***, that is, he/she is very, very rich - the ***ee/o*** being used to emphasize how wealthy he/she is; and "rich man/woman". It is interesting to note that when they think of a poor man/woman "***ohiafo***" (Ga), ***ohiani*** (Twi), they do not think in terms of occupation but solely in terms of wealth or what he has or can afford.

5. The rites of passage -- births, initiation ceremonies, marriages, and deaths -- place heavy demands on extended family members. The upper class members are expected to shoulder a larger proportion, if not all, the expenses. Funerals, burials, memorial services, and other anniversary celebrations are the most expensive of all. The elders of the family collect monies which are announced -- the name of the contributor and the amount. It is an occasion where you have to "do something" in order not to bring disgrace to yourself and your side of the family.

6. Technically "bilateral" refers to a system like the United States. Since there is no technical term for individuals with parents from both matrilineal and patrilineal kingship systems, I will the term "bilateral" to describe such individuals.

7. A locality is defined as any nucleated and physically distinct settlement which has a name or a locally recognized status. Thus, a locality may be a single house, hamlet, camp, village, town, or city. Generally, a distance of 200 yards is taken as the maximum open space or non-built up area permitted between two parts of the same locality. Settlements further apart should normally be regarded as separate localities. However, this is not applicable to the Northern Region (Central Bureau of Statistics 1981, 3).

8. The Central Bureau of Statistics, has been renamed the Statistical Services Division of the Ministry of Transport and Communications.

9. Palm oil was the leading export crop until 1885 when the fall of world market prices for palm oil led to the search for new sources of raw materials for export crop production. Cocoa was one of the crops introduced into the Gold Coast (now Ghana) and first grown on the ***Akwapim*** Ridge.

Four waves of migration followed the introduction of cocoa into the Gold Coast. The first wave started with the early development of cocoa. ***Akwapim*** farmers moved to the ***Akyem*** area in search of land for expansion of cocoa following the exhaustion of local supplies of land on the ***Akwapim*** Ridge. The second and third waves of migration took place with the cocoa expansion in the 1920s. This was a response to the demand for more raw materials through expansion of existing farms and development of new farms. There were two streams of migrants: the Shai, Anum, and Boso farmers moving to the ***Akyem*** area and the migrants from the north moving south to the Asante and Ahafo cocoa lands. A final wave of migration followed the depression of the 1930s as cocoa prices dropped. Rural residents with no prospects in their communities moved from the farming communities to the urban areas to work as wage laborers in industries.

10. The Eastern Region was part of the Southern territories until the creation of regional administrative boundaries when it assumed the name Eastern Region. This region included the area now known as the Greater Accra Region. In 1960, a separate region was created for the capital of Ghana,

Accra, and its surrounding districts. Ghana now has ten administrative regions, the tenth, created from the division of the Upper Region into the Upper East and Upper West Regions.

11. In 1983, a large number of Ghanaians were sent back to Ghana from Nigeria. These migrants were predominantly men who travelled to Nigeria when the Nigerian economy started booming from the oil discovery. About one million of those ordered back to their countries were Ghanaians. They returned with no job prospects. These return migrants partly explain the increase in the overall population and in the proportion of males in the Eastern Region.

Another possible explanation for the increase in the proportion of males and the growth in population is the change in government agricultural policies. In the mid-1980s, the government increased the producer price of cocoa. According to the chief of Atibie whom I interviewed during the survey a significant number of the young men who had abandoned farming and had left for the cities (especially Accra) in search of other income-earning opportunities, were all coming back to continue farming. This could be true of the whole Eastern Region (see Fig. 10 for location of Atibie). A photograph of the chief is shown in Appendix 3.

12. A significant number of migrants residing in Accra are from this region. A majority of the residents on the ***Akwapim*** Ridge, especially the men, work in Accra. In the mornings, they take private buses or the government omnibus service to Accra and then return to the Ridge in the evening. I also boarded these buses whenever I travelled to the communities on the Ridge. In the mornings, the buses going to this area would be fairly empty because people travelled in the opposite direction to Accra. Whenever I travelled in the afternoons, the buses would be packed with people returning home from work in Accra. Sometimes the buses were so full that one had to stand for the entire journey.

On weekends, the buses had a reverse pattern. They would be filled up for the journey to the "mountains". The travellers are usually migrants who live in the city on weekdays and go back to their communities for the weekend. The rest of the travellers are permanent migrants going to visit family and friends or attending funerals.

13. The Ghanaian population is made up of 51 percent females and 49 percent males.

14. The chief of this locality, Oyeman Wereko III, known in private life as Mr. E.N. Omaboe, was formerly the Minister for Finance and Economic Planning and is now a private consultant.

15. In southern Ghana, chiefs are enstooled because they sit on stools in state. In the north, the chiefs are enskinned because they sit on skins. This is a Moslem tradition. Northern Ghana is predominantly Islam. This is similar to the enthronement of kings and queens in England.

16. This is a translation of the conversation which was held in **Twi**. The Chief's exact words were,"***Se wo soree anopa wondidiee na se wo be bisa wo se deaben na wo dii ene a, men to sikan nwo won.***"

17. A house or compound is a structurally separate and independent place of abode. The essential features are separateness and independence. An enclosure may be considered as separate if it is surrounded by walls or fences so that a group of persons can isolate themselves from other persons in the community for the purpose of sleeping, preparing and taking meals, or protecting themselves from the hazards of climate such as storms and the sun. Also, any shelter used as living quarters at the time of the survey, e.g. a hut or group of huts, is treated as a house or compound (Central Bureau of Statistics 1981, 3).

18. I speak both **Ga** (my mother's language) and all the dialects of the **Twi** language (my father's language is **Asante**, a **Twi** dialect). I could speak all the local languages with the exception of those used by the Adangbe ethnic groups -- **Krobo**.

The Somanya, Sra and Sawer localities spoke **Krobo**, which I could not speak. All Krobos and Ada-speaking people understand and speak **Ga** fluently because it is closely related linguistically to their language. Gas can understand some **Krobo** and **Ada** but cannot speak it.

The people of Larteh are bilingual; they speak **Larte** and **Akwapem Twi**. We communicated in **Twi**. In Abiriw, although the main language was **Kyerepong**, they also spoke **Akwapem Twi**. The questionnaire was administered in the language the respondent was most comfortable with. For most of the respondents, especially those in the rural localities, the local language was used. In the urban localities, some people preferred the local language even though they were literate.

PROPERTY

Introduction

This chapter examines women's access to property in Ghana. It discusses types of property, the significance of property, traditional and modern land-tenure system, gender differences in access to and control over property, intergenerational transmission of property and women's changing relationship to land. The chapter also addresses laws and legislation relating to property and its impact on women.

Significance of Property

Property in Ghana is in the form of both tangible and intangible items. It includes land, capital, houses, businesses, farms, arcane knowledge, fertility, succession to office, and wives. Property, in this study, is limited to physical resources.

Property is seen as the legal construction of the economic element in a husband and wife relation. Property constrains men and women to act as different subjects (Whitehead, 1984). Relationships between men and women are structured by access to, control of, and transmission of property. Property rights and relations confer power and status on men and women. Differential access to property influences status and gives rise to inequalities in access to capital and credit. Property gives access to critical resources for production -- land and capital. Access to land is important for capital acquisition. Land and other physical resources can be converted to resources for human capital development, such as education. It can be converted from immovable property to movable property. Fluid capital is also derived from real estate rents (Westwood 1984). Because property, rights, duties, and titles are distributed on the basis of kinship, seniority, and gender (ibid.), access to property and land is bound by kinship, marriage, the sexual division of labor, and rights and obligations.

Okali (1983) argues that the property rights of persons other than those of the descent group hinge on the ability of individuals to gain direct access to resources and thus to acquire personal property, as distinct from corporate property. Personal property may go to sons or all children, wives and sisters rather than to nephews who are the traditional heirs in matrilineal societies. It is usually money rather than actual property which is divided among children. Since independence, African elites have used their wealth and access to resources to obtain superior education for their children. In Ghana, the wealthy cocoa farmers have also used money derived form cocoa sales to educate their sons.Okali documents the case of a Fulani patrilineal society in northern Ghana in which women have been able to acquire land in their own right (Okali 1983, 6).

In matrilineal Ashanti courts, most of the land litigations are a result of conflicts -- the problem of distinguishing between what is acquired and what is corporate property. The matrilineage usually considers all the lands belonging to the deceased as corporate property[1] (ibid). These lead to conflicts between a man's children and heirs and the matrilineage.

Access to and Control Over Property: Traditional Practices

Land-tenure and Ownership

In the pre-colonial Ghanaian economy, land was the most important factor of production. The system of land ownership determined the structure of the economy. Land was not held privately but was owned by the whole community. Members of lineages had only user rights over the land (Birmingham et al. 1967, 252). In the matrilineal societies, the leaders of the community were in charge of the land, while in the patrilineal societies, it was the priests who were in charge of the land and performed rites to ensure fertility of the land (Bukh 1979, 25). The priest or community leader was regarded as the "owner" or the caretaker of the land and officer of the state in whom was vested the right to make grants of land. A fair share of available land was the right of every member of the community. The product of the land belonged to the family that cultivated it, and there was no leisure class deriving its income from the land (Hymer 1969,2). Since land was owned by the whole community, the possession of "usufructuary title" was the highest form of tenure an individual may acquire in land (Birmingham et al.1967). The land policy was designed to protect against artificial scarcity and to ensure that it land did not accumulate in the hands of a few (Hymer 1969, 3).

The Sociocultural System

The social organization of the people, including property and inheritance, is determined through the sociocultural system. There are two main systems: matrilineal and patrilineal[2].

In patrilineal societies, descent and inheritance are through the paternal line. Women are more subordinate; they do not inherit property. Even when they have acquired property through gifts, they accept it in their sons' name. A woman is limited to the private sphere, especially in Moslem cultures. Here again there are rural/urban and class differences. Women with children are also better off regarding property rights.

In the matrilineal society, decent and inheritance pass to males through the maternal line. Women are thus able to acquire individual property. They have higher status and power; some women even held political positions in the pre-colonial days. Despite their status and power, women in matrilineal societies do not have as much control as is assumed. In the domestic arena, they are subordinate to the male members of the household just like their patrilineal counterparts. In the matrilineal systems, although women have access to land and have been able to acquire property, their plots are much smaller than those of the men (Vellenga, 1977). If wives are given land, it is on behalf of their children. In the matrilineal societies, distribution of titles is through females, but it is not necessarily for females. There are cases where outsiders have married Akan females to gain access to property.

Contemporary Ghana

Presently, land is considered private and not a government property. Private property can be individual or lineage. Authority to manipulate land is vested in male lineage elders. Land is increasingly moving from lineage property to government and individual property. Sale to the government has become a large source of income for lineages, priests and other individuals. Proceeds from the sale of lineage lands to the government go to men (Robertson 1990, 49). Income from rent of land and houses also goes to men. The lineage property can dwindle in size and importance as a result of members having been given portions to farm or build on, which then becomes personal property. Such land then becomes an entitlement rather than corporately owned land which each lineage member, in due time, can claim his portion.

It is only occasionally that women become lineage heads -- these women must have passed menopause (ibid). Female lineage heads are only allowed authority over other women and are allowed to take part in the transactions. Because property is controlled by lineage heads and women rarely get the chance to be heads of lineages, property is used to the advantage of men.

In modern Ghana, whether in patrilineal or matrilineal system and regardless of the form of marriage, a wife is still not a member of her husband's lineage. This is because of the way a family is defined, namely as "the group of persons linearly descended from a common ancestor, exclusively through males in the patrilineal communities, or exclusively through females in the matrilineal communities, and within which succession to office and to property is based" (Manu 1984, 21). Thus, the concept of family ignores one segment of the individual's family whereas customary law denies any concept of the conjugal family. In the matrilineal system, the children are not members of their father's family. When the father dies, the wife's family has custody of the children while the man's family keeps the property. In fact, in matrilineal societies, the father represents just the biological father, the "genitor," rather than the social father or "pater." A matrilineal widow has no right to her husband's property although she may have contributed to its acquisition. Worse than that, she can be driven out of the home upon the death of the husband. Although the patrilineal women also do not inherit property, they are better off because their children inherit property and are expected to look after their mothers.

Patrilineage gives the oldest son of the senior wife first and major claim over his father's property upon the latter's death. The senior daughter gets the estate of her mother, but she competes with maternal aunts and her female siblings who also have claims (ibid., 145). Women use both kin and non-kin relationships to gain access to property. They acquire property by themselves, through marriage, and through inheritance. Access to property leads to the empowerment of women because of the role that property plays in the Ghanaian social structure.

TABLE 32

WOMEN'S TRADITIONAL ACCESS TO, OWNERSHIP AND CONTROL OVER PROPERTY

STATUS	Matrilineal			Patrilineal		
	Access	Ownership	Control	Access	Ownership	Control
Wife	Yes	No	No	Yes	No	No
Sister	Yes	Yes	No	Yes	No	No
Daughter	Yes	No	No	Yes	No	No

Although all women had access to and use of property, most had no control over its disposal. Educated women are more likely to acquire private property than uneducated women, an effect of class and income.

The situation of matrilineal urban women is more vulnerable than those who have continued to live in their family houses, farming or trading in their hometown (Oppong 1982, 117). As sisters, daughters and nieces, few can expect to have the same social status in their hometown as they receive from their husbands in the cities. There is no difference for patrilineal women since they do not inherit.

Strategies that women use to acquire property include endowing the heir with small amounts of self-acquired property in order to escape the disabilities imposed by male dominance. Women also pay for the funeral expenses of the deceased because by meeting funeral obligations, they lay a claim on the heir who is then obliged to reciprocate that gesture. In the cities, since customary land which is centrally located is tightly controlled by the male lineage heads, women try to acquire suburban land. The advantage of self-acquired property for women is that they can pass it on to whomever they please. They can also use it to acquire power. Self-acquired property is usually passed on to children as gifts. Reciprocity is strong between mother and daughter; therefore, it becomes more of an obligation than a gift. Nevertheless, Robertson notes that there is the tendency for individually acquired property to become patrilineage property.

In the case of the matrilineal communities, the separation between the heir's self-acquired property and corporate property becomes blurred, leading to a lot of court litigations. This is partly because the heir is expected to upgrade or add on to the property. The matrikin usually consider his self-acquired property as corporate property which leads to conflicts between the matrikin and the heir's children upon his death.

In search of equality: the legal system

In 1963, a Bill on Uniform Marriage, Divorce, and Inheritance was published. It provided that a man could register only one wife, who would be publicly recognized as his wife. If the man married another, it would be grounds for divorce (Manu 1984, 29). Therefore, only the registered wife will inherit upon the death of the man intestate. All the children, however, will however be entitled to a share of the property. Those married under Marriage Ordinance were to be regarded as the registered wives. This was not fair to women married under customary law. Divorce was to be based on customary law procedures.

In death, the surviving spouse takes one-sixth of self-acquired property, children take two-thirds and family one-sixth. Customary law was not to be used to devolve the property. In 1975, a proposal was made to register all customary marriages. The form of marriage was not to be used as a determining factor. It is said that the 1979 Constitution did not define family nor question its basis and seems to condone polygamous families, where the position of women is insecure and unequal (Manu 1984, 32). The government is in a sense promoting, if not legitimizing, male dominance.

Government efforts to revise and bring some uniformity into the law brought some help to widows.

In 1982, attempts were made to review proposals and enact laws. In 1985, the Law Reform Commission in Ghana focused on altering allocative policies and credit schemes. It addressed the necessity for reforms in relation to marriage, property to property, and practices affecting wives and children (see Manu, 1984). The commission enacted the Law of Intestate Succession (1985) PNDCL 111. Because of the new law of inheritance, extended family members of the deceased are unwilling to take interest in the funeral arrangements of the man. They argue that since the wife and children are going to inherit the man's property, they should bear the funeral expenses (Mensah-Bonsu, 232). This placed an extra burden on wives and children.

Mensah-Bonsu argues that this law has differential effects on women depending on their class, marital status, and whether they have children. For women who are married through the customary system and have no expectation of inheriting from the husband's estate, this law provides security. It confers on these women a specific interest in their husband's estate. Since this law has a very liberal definition of "children," anyone can come and claim that the deceased is the natural father of their child. This law is to the advantage of unmarried mothers. It removes the anxiety that existed concerning the welfare of her child/children. Unfortunately, the woman who has toiled with the man will be the loser. Women will therefore try to acquire their own independent property instead of contributing to their husband's property because there is the suspicion that men may have side issues (ibid). Childless women stand to lose the most from this law because husbands of childless women may have children outside the marriage. The childless woman gets only three-sixteenths of the husband's property while the husband is entitled to half of hers if she precedes him in death. As Mensah-Bonsu aptly puts it, "society could not have declared its contempt for childless women more loudly than it has under the law" (Mensah-Bonsu n.d., 233).

Although men and women are equal in the law, attempts to use laws and legislation to give women a fair share in property, access to resources, and correction of gender inequalities have not been to successful. Manu (1984) argues that existing laws condemn women to an inferior position in the family. There have been few changes despite acceptance of equality in the law.

Women's lack of access to resources and the unequal distribution of resources, rewards, rights, and authority between men and women leads to reinforcement of sex-role differentiation, ideological assumptions about a woman's place, and an imbalance of power between the sexes -- even in decision making pertaining to issues that can affect the nation and development, such as birth control and fertility. Although fertility has been shown to decrease with the level of education of women, this is not automatic. Women need to make the decisions to reduce their fertility. When women do not have the power to make these decisions, the positive effects of fertility education is lost.

Although there have been advances in education, health, credit, and employment, progress in development cannot be achieved if women's share in the power and resource structure within the family is not addressed. The solutions do not lie in the existing framework. They are embedded in norms, sex roles, ideologies, and entitlements -- and also women's perceptions. Equality in the law is certainly a step forward, but there is the need for reforms within the sociocultural framework.

ANALYSIS

This case study on the Eastern Region of Ghana examines types of property, ownership, and transfer. The objective was to see the pattern of property transfer, particularly the intergenerational transfer of resources, the institutional context within which property rights, duties and obligations are determined. The legal context is also examined to see the effect of laws, legislation, and enactments on women's access to resources.

Data was gathered and analyzed for 204 households stratified by gender, class, region and sociocultural group. 104 households (51 percent) were female-headed households and 100 were male-headed households. The distribution of the sample by these categories is shown in Table 33. To address the issue relating to women's access to and control over property, the following questions were asked:

1. the type of property they had -- property was classified into land (for building), houses, business, stocks, factories, agricultural land, and farms.
2. the location of the property,

3. the size of the property,
4. ownership -- whether it belonged to the husband or wife, wife's family, or husband's family, or other,
5. mode and date of acquisition,
6. who it was acquired from,
7. who they project to transfer this property to, relationship, and reason for transfer to this particular individual. The [illegible] categories given were by rules -- rules of inheritance, part-ownership, or other reasons.

Results

TABLE 33. DISTRIBUTION OF SAMPLE BY CATEGORIES

Variable	Categories			
		Number		
Gender	Female	104	Male	100
Class	High	98	Low	106
Socioculture	Matrilineal	106	Patrilineal	98
Region	Urban	101	Rural	103

TABLE 34. PROPERTY OWNERSHIP BY SEX OF THE HEAD OF HOUSEHOLD

Property	Female		Male	
	Number	Percent	Number	Percent
0	41	39	34	34
1	34	33	28	28
2	19	18	18	18
3	7	07	17	17
4	0	00	2	2
5	1	01	0	0
6	1	01	2	2
7	0	0	0	0
8	1	1	0	0
Total	104	100	100	100

Figure 32. Distribution of Property by Sex of Household Head

Of all the households, 36.76 percent (75) did not have any property. Another 33 percent of the households had more than one property. The distribution of property by sex is shown in Table 34 and illustrated in Figure 32. Female-headed households constituted 57.35 percent of this group, and male-headed households 42.7 percent. One of the females was of a male-headed, low-class, patrilineal household in the urban area. This woman had eight properties. Five of the properties are land and the other three are houses. She has acquired seven of these properties herself and received one as a gift.

When asked who she projected to pass these properties on to, she said her family, by rules. The fact that this individual is classified as low-class by occupation (trader), indicates that there is a problem with the use of occupation as a measure of class. This woman is clearly very wealthy.

The group with the largest number of households without any property is urban women. A total of 58.53 percent of all female-headed households (24) and 32 percent of all households have no property. This confirms the observation made by Oppong (1982) that urban women are more vulnerable than rural women when it comes to acquiring property as gifts because of the break in ties. Urban women do not perform the home duties that the rural woman do. There was very little difference between patrilineal and matrilineal female-headed households with no property (see Table 35).

TABLE 35. HOUSEHOLDS WITH NO PROPERTY

VARIABLE	CATEGORIES			
	Female		Male	
Class	High	Low	High	Low
	18	23	11	23
Region	Urban	Rural	Urban	Rural
	24	17	22	14
Sociocultural	Matrilineal	Patrilineal	Matrilineal	Patrilineal
	19	21	25	9

TABLE 36. OWNERSHIP AND CONTROL OF PROPERTY BY SEX

Control	Female		Male	
	Number	Percent	Number	Percent
Self	33	51.56	60	83.30
Spouse	19	29.69	2	2.77
Joint	4	3.84	6	8.33
Relatives	7	7.686	4	5.53

A distinction was made between ownership of property and control of property. Although 63.23 percent of the sample had property, only 68 percent said they actually had control over the property -- its use and transfer.

Only 51.56 percent of female-headed households said they had control. 83 percent of the males had control. Of property belonging to female-headed households, 29 percent was controlled by their husbands. Only 2.77 percent of property belonging to male-headed households was controlled by their wives (see Table 36). This is illustrated in Figure 33.

Figure 33. Ownership and Control of Property by Sex

Projected Property Transfer

Mode of transfer

The respondents were asked who they projected to transfer property to and how. As illustrated in Figure 34, 51.77 percent (73) of the sample said they were going to transfer to those individuals by rules. This meant that if they were matrilineal, they were going to transfer to nephews, and if patrilineal, to younger brothers and senior sons of senior wives. Of males, 82 percent projected to transfer by rules. A total of 66% were going to give property to children, which implied that they were patrilineal, 10 percent to sons (patrilineal), 14 percent to nephews (matrilineal), and 14% to brothers (patrilineal).

A total of 28.4% said they were transferring property by rules, but upon further examination, the data shows that they were deviating from the rules. For example, a matrilineal male passing property to his children is not by rules. It is for other reasons, as a gift or a part-ownership. The same applies to matrilineal women who inherit land. They are simply vehicles for transfer of land to sons; they do not have the right to dispose of the land.

Of the households with property, 28.4 percent said they will be transmitting by rules when they had actually deviated from the rules -- 55 percent to children (matrilineal), 17 percent to wives, and 7 percent to family. Although these individuals have designated property for wives, conflicts with the husband's family when he dies make it difficult to rely on this property. This is especially true, if he does not leave a will.

A total of 19.8 percent were going to give their property as gifts to individuals who owned part of the property. All the males in this group were going to give the property to their children (45 percent), to their sisters (14 percent), to brothers and daughters (9 percent each). Females had designated 38 percent to daughters, 54 percent to all children, and 8 percent to family. Although property has been designated to wives, the wives would not have control over it. The projected property transfer by relationship to the property owner is illustrated in figures 35 and 36.

Figure 34. Projected Property Transfer by Relationship to Property Owner

Figure 35. Projected Mode of Property Transfer: Mode of Transfer, Total

Figure 36. Projected Mode of Property Transfer: Mode of Transfer, By Sex

Intragenerational transfer of property

Some of the property was projected to be transferred to individuals within the same generation and others for the next generation. Of the projected transfers, 69 of the individuals designated people of the same generation as recipients of property. Females said they were giving them to family with no break down in the relationships. On the whole, 55.5 percent was to go to spouses, 27.8 percent to brothers and 16.7 percent each to sisters and family (see Figure 37).[3]

Intergenerational transmission of property

Of all property designated for the next generation, 74 percent is intended for all children, 12 percent to sons and 7 percent each to daughters and nephews. It is interesting to note that nephews had one of the smallest designations. Considering that they are the main heirs in matrilineal societies, one would expect them to have a larger share. Females designated 42 percent to daughters, 58 percent to and children. It is clear that the only chance the next generation of women have of owning property is through their mothers. This is illustrated in Figure 38.

Research indicates womer are gaining more access and control of property. Since the customary ways of inheritance do not assure them any security, women should find their own income to purchase land so that the females of future generations can be assured of property which they can control and convert to other resources.

Figure 37. Projected Mode of Property Transfer: Intragenerational Transfer of Resources

Figure 38. Projected Mode of Property Transfer: Intergenerational Transfer of Resources

NOTES

1. This was also borne out from a discussion I had with an Ashanti student at the University of Wisconsin-Madison on February, 16, 1986. He explained that problems arise when a man does not make a clear distinction among various types of property -- property he inherits, inherited property he upgrades, and property he personally acquires. His children might end up thinking it is theirs. At the same time even though it is very clear to every one that the property was not part of that he inherited, the matrilineage usually does not believe in property going to children but to the heirs and therefore bluntly refuses to acknowledge property as being individually acquired. Most of these court cases, he claims, are never settled.

2. The Fantes are double-descent, following both patrilineal and matrilineal systems. Descent, property, and inheritance are traced through the matrilineal lines while patrilineal lines are used for membership and inheritance in ***asafo*** groups (war companies).

3. There are some changes in the intragenerational transmission of property: the brideprice. The economic crisis of the 1970s and structural adjustment policies of the 1980s along with a general decline of real incomes and an increase in prices of goods and services have made it difficult for young men to afford the brideprice. This results in delayed marriages and changes in the traditional sources of the brideprice. Females, especially in the urban areas, are contribute to their own brideprice in order to help their fiances financially. This is a radical move from tradition, where brideprice was the responsibility of the man and his family. The woman's contribution might give her more power in decision making within the household after they marry.

Since traditionally the brideprice serves a social function, what does it mean for the exchange now that women are contributing to their own brideprice? Brideprice makes the husband the legal father, women therefore become legal minors. Since brideprice can be reclaimed after a divorce, women may choose to stay in the marriage because her family may not be able to refund the brideprice.

CONCLUSION

With regard to property, there are gender differences in access and control. Women still have limited access to inherited property. With increasing privatization of land, there is decreasing land for everybody's "free" use. For women, this means an increasing risk that if they cannot purchase land and not inherit land, they will lack access to land. Hence, the rising importance to women of securing independent sources of capital to acquire land. Trends reveal that women are succeeding and are gaining more control over land, which they use to advance themselves and their children.

In the section on property transfer, respondents were asked questions on who they inherited their property from and how; to whom they will pass on their property; and why they will transfer property to this individual -- whether due to rules, the recipient being part owner, or other reasons. For instance, most of the respondents, including those from the matrilineal descent group, who traditionally transmit property to their nephews through the maternal line, said they would transfer property to their own children because of obligation. This shift is the result of the general decline of real incomes, an increase in prices of goods and services; and an overall scarcity of resources brought on by the economic crisis of the 1970s and structural adjustment policies of the 1980s in particular. In the absence of abundant resources, traditional systems of transmission tend to break down. The changes in the operation and dynamics of property relations are a reflection of household response to macro changes.

Theoretical

The importance of the links between household research and macro policy analysis was not made very clear in the earlier literature on women in development. More recent literature has moved away from issues of integrating women as beneficiaries of development to treating women as active agents of development and the linkage between women's status and national development. The theories identify household decision-making models and their links to macro policy. The theories being used are based on household economic models with broader macroeconomic and environmental implications (World Bank 1991).

Development planners and policy analysts rely on the analysis of household data to gauge the effects of economic policy on the population. In this regard, studies on intrahousehold dynamics relating to investment and decision making are particularly important. Such studies provide information on household response to macro policy changes. More research is needed to provide information on these linkages. Particular interest is in determinants of women's productivity in the wage labor force and how to improve women's access to the determinants of productivity -- education, health, nutrition and family planning, extension and credit (ibid). This dissertation supports this approach. It adds to the understanding of the situation of women, and of the structures and mechanisms that define women's roles, limit their access to productive resources, and determine their status and power -- in other words, the institutional and sociocultural contexts within which women work, the interaction of micro and macro factors, and how these constrain women's access to resources, impede their participation in development, and thus generate and reinforce gender inequalities. It emphasizes the importance of studying specific societies not only to understand the situation of women, but also to gain a better understanding of development needs at the societal level. It provides information on the determinants of women's physical resources and human capital development -- access to education and property. It demonstrates linkages between household decision making and strategies and its relationship to productivity. The information provided on household decision-making relating to education and property will allow policy analysts make decisions on which areas to invest in to maximize returns on government investments.

There is evidence worldwide that education is the key to gaining access to more opportunities for work and income streams. It has been demonstrated that investment in women's education produce about the same relative private internal rates of return as measured by their proportional increase in wage rates (World Bank 1989b). Studies in Thailand and Peru also generally confirm strong rates of return on women's education at the primary school level, but would reduce rates of return on university education (ibid). It is therefore cost efficient for governments to invest in universal primary and secondary education. Evidence confirms the theory that education is particularly important in enabling people to respond to and

capitalize on a changing environment. Evidence from Kenya and Nepal demonstrate that several years of education may be needed to equip people to respond to opportunities. In Ghana, there is evidence to show that total fertility rate is higher for people with primary education than for those with no education. The rates start dropping for women with middle school education and further for those with higher education.

A number of research studies sponsored by the World Bank clearly demonstrate the linkages between women's education and national development (World Bank 1989a, 1989b). The World Bank's research strategies for the 1990s are directed towards providing data to demonstrate these linkages. Among the areas marked for attention are research on (1) assessment of poverty and impact of policy on household consumption and human resource investment, (2) human resource and economic productivity, with special attention to women's economic productivity and to the formation and use of skills, and (3) management of human resource development, especially economic management, but also technical and institutional management (World Bank 1991, 4). The dissertation adds to the literature on women in development issues and their linkage to national development.

Findings

From the analysis done for the thesis, the clearest findings are as follows. Enrollment has increased for women in Ghana but gender differences still remain in the levels of education attained. Generally, girls are dropping out of school earlier than boys. Rural girls have more problems staying in school. The main reasons given for the premature termination of education were financial, household duties, and lack of interest in education. This shows clearly that household duties are a constraint to participation in education, particularly for females. Some of the lack of interest in education stemmed from the lack of employment opportunities; this makes more of a difference to girls than boys.

With regard to property, there are gender differences in access and control. Women still have limited access to inherited property. With increasing privatization of land, there is decreasing land for everybody's "free" use. For women, this means an increasing risk that if they cannot purchase land and not inherit land, they will lack access to land. Hence, the rising importance to women of securing independent sources of capital to acquire land. Trends reveal that women are succeeding and are gaining more control over land, which they use to advance themselves and their children.

Strengths and Limitations of the Study

Strengths

The strength of this approach lies in the design of the survey instrument and in the sampling procedure employed. By using a stratified sampling procedure along the dimensions being studied -- gender, class, region, and sociocultural group -- observations about groups of individuals across these dimensions could be made and conclusions drawn about the relationships between these dimensions and their effects.

The questionnaire design also allows the complexities of phenomena to be revealed. Unlike previous studies which focus on particular types of inequalities this study addresses the three critical dimensions of human society -- gender, class, and region -- and demonstrates that barriers inhibiting the progress of women towards a more equitable standing vis-a-vis their male counterparts is inextricably linked to their class and region. For example, analysis of the data on level of education attained showed that 77.27 percent of the residents with university education were males and 22.73 percent females. One would then expect males in both high and low classes, in both urban and rural regions, and in both patrilineal and matrilineal sociocultural groups to be more likely to be university graduates than their female counterparts. The analysis of gender across classes and sociocultural groups supports this expectation. In the analysis of gender and class, university graduates are mostly male high class, followed by male lower class, female high class, and female low class. With socio-cultural groups, males in the patrilineal group were the most educated, followed by matrilineal males, patrilineal females, and then matrilineal females.

An examination of education according to gender across regions, however, does not fit this model. The results reveal a different educational order, headed by males in urban areas and followed by females in urban areas, males in rural areas, and females in rural areas. It is significant that there are more university-educated females in urban areas than university-educated males in rural areas. This shows that there is an interaction between gender and regional inequalities. The amount of education an individual receives depends not only on that particular individual's sex or location but also on the interaction between the two.

This research addresses both macrolevel attributes as well as microlevel dynamics. The study, unlike most macro studies, is able to balance size and detail. Although it is extensive -- 1,600 households, the study does not compromise on detail. It provides detailed information at the household level of factors that give rise to gender inequalities in access to education and property, whilst at the same time being able to move beyond the sample to test whether observed differences are significant across the sample.

For example, in the section on property transfer, respondents were asked questions on who they inherited their property from and how; to whom they will pass on their property; and why they will transfer property to this individual -- whether due to rules, the recipient being part owner, or other reasons. For instance, most of the respondents, including those from the matrilineal descent group, who traditionally transmit property to their nephews through the maternal line, said they would transfer property to their own children because of obligation. This shift is the result of the general decline of real incomes, an increase in prices of goods and services; and an overall scarcity of resources brought on by the economic crisis of the 1970s and structural adjustment policies of the 1980s in particular. In the absence of abundant resources, traditional systems of transmission tend to break down. The changes in the operation and dynamics of property relations are a reflection of household response to macro changes.

The physical design of the survey instrument also facilitates data analysis. It makes the data speak for itself when the right questions are asked. Sophisticated analysis is not required for conclusions to be drawn. The survey data will provide a rich descriptive base for understanding the specific conditions at the household level which explain the situation of women in Ghana and how this is linked to overall socioeconomic changes in the Ghanaian society.

The composition of the questionnaire makes it possible to draw information from one section to explain or draw conclusions about some observation in another section. These different sections or themes of inquiry within the same design reinforce complement to each section. This is missed from a standard questionnaire or secondary analysis.

For example, it was hypothesized that there are gender differences in levels of education attained and that females have lower levels of education than males, and there are gender differences in education participation, with females having lower participation rates than males. It was also hypothesized that females spend more time on household activities than males; and that female participation in education is more constrained by household activities than male participation.

Data for these hypotheses were pulled from different sections of the questionnaire. Data on the highest level of education attained from the household characteristics section were used to analyze gender differences in level of education. To learn why respondents ended their education at the levels they did, data were also collected on reasons for ending education. The three major reasons that came out were financial, "lack of interest," and household duties.

Of the respondents who cited household duties, 69.1 percent were female, and 21.9 percent male. Without any sophisticated analysis, one can infer that females spend a greater proportion of their time doing household chores. Absenteeism may not always lead to the decision to quit school. It does, however, affect participation in education and leads to poor performance. The fact that household duties was one of the major reasons why people quit school supports the claim that household activities act as a constraint to participation in education. The difference between the percentage of males (21.9 percent) and females (69.1 percent) who ended their education because of household duties supports the claim that household activities constrain female participation more than male participation in education.

Insights are gained from the open-ended nature of the questionnaires, which adds texture to the analysis and makes one see what is actually happening. For example, the section on how respondents

are transmitting property and why, investigates local perception of class and correspondent occupations for each class, and reveals the effects of social and technological change. Actual happenings, including the dynamics, course, and results of these events can be captured. The insights gained from such dialogue are lost in close-ended questionnaires.

Limitations

A study of this nature and size is costly, in both time and money. The size and the number of variables involved make coding and data entry tedious and time consuming. There is the tendency to get lost in all the detail and the uniqueness of phenomena.

Contributions

Theoretical

The importance of the links between household research and macro policy analysis was not made very clear in the earlier literature on women in development. More recent literature has moved away from issues of integrating women as beneficiaries of development to treating women as active agents of development and the linkage between women's status and national development. The theories identify household decision-making models and their links to macro policy. The theories being used are based on household economic models with broader macroeconomic and environmental implications (World Bank 1991).

Development planners and policy analysts rely on the analysis of household data to gauge the effects of economic policy on the population. In this regard, studies on intrahousehold dynamics relating to investment and decision making are particularly important. Such studies provide information on household response to macro policy changes. More research is needed to provide information on these linkages. Particular interest is in determinants of women's productivity in the wage labor force and how to improve women's access to the determinants of productivity -- education, health, nutrition and family planning, extension and credit (ibid). This dissertation supports this approach. It adds to the understanding of the situation of women, and of the structures and mechanisms that define women's roles, limit their access to productive resources, and determine their status and power -- in other words, the institutional and sociocultural contexts within which women work, the interaction of micro and macro factors, and how these constrain women's access to resources, impede their participation in development, and thus generate and reinforce gender inequalities. It emphasizes the importance of studying specific societies not only to understand the situation of women, but also to gain a better understanding of development needs at the societal level. It provides information on the determinants of women's physical resources and human capital development -- access to education and property. It demonstrates linkages between household decision making and strategies and its relationship to productivity. The information provided on household decision-making relating to education and property will allows policy analysts make decisions on which areas to invest in to maximize returns on government investments.

There is evidence worldwide that education is the key to gaining access to more opportunities for work and income streams. It has been demonstrated that investment in women's education produce about the same relative private internal rates of return as measured by their proportional increase in wage rates (World Bank 1989b). Studies in Thailand and Peru also generally confirm strong rates of return on women's education at the primary school level, but would reduce rates of return on university education (ibid). It is therefore cost efficient for governments to invest in universal primary and secondary education. Evidence confirms the theory that education is particularly important in enabling people to respond to and capitalize on a changing environment. Evidence from Kenya and Nepal demonstrate that several years of education may be needed to equip people to respond to opportunities. In Ghana, there is evidence to show that total fertility rate is higher for people with primary education than for those with no education. The rates start dropping for women with middle school education and further for those with higher education.

A number of research studies sponsored by the World Bank clearly demonstrate the linkages

between women's education and national development (World Bank 1989a, 1989b). The World Bank's research strategies for the 1990s are directed towards providing data to demonstrate these linkages. Among the areas marked for attention are research on (1) assessment of poverty and impact of policy on household consumption and human resource investment, (2) human resource and economic productivity, with special attention to women's economic productivity and to the formation and use of skills, and (3) management of human resource development, especially economic management, but also technical and institutional management (World Bank 1991, 4). The dissertation is adds to the literature on women in development issues and their linkage to national development.

Methodological

The data base collected during this research tries to capture the structures and mechanisms seen as influencing the status of women and gender inequalities in developing countries. It shows gender differences in activity patterns and access to and control over resources and rights to benefits. The data base covers household physical attributes, housing quality and property inventory, household membership (resident and non-resident household members; and household non-member assistance) intrahousehold dynamics relating to decision making, the sexual division of labor, sources of income and resources distribution within the household.

Policy Implications of Study

Discussion

The results of the study show that development has mixed effects on the status of women. The results of the analysis on education and property show that although women have limited resources relative to men, in absolute terms, women have more access to resources than they did a decade or two ago. Enrollment has increased for women in Ghana but gender differences still remain in the levels of education attained. With regard to property, there are gender differences in access and control. Women still have limited access to inherited property but are succeeding in purchasing property and gaining more control over land.

Property

My results also show that although there is still a gender differential in control over property, women's ability to control property has improved. A majority of women who own property acquire it themselves, while others receive it as gifts from husbands. Traditionally, all women had access to property and they could use it. The matrilineal women inherited property directly from brothers, but it was often held in trust for their sons. Women still have limited access to inherited property. The advantage of private property for women is that they have control over it and are free to dispose of it as they want. Some women have projected passing on this private property to their daughters, children (sex not specified) and family. This is particularly important for girls.

Government efforts to increase women's ability to inherit property have had very little success. In spite of laws and legislation, the inheritance rights of women, especially wives, are still not recognized by custom and tradition. The key to women's access to property is through private acquisition: women acquire personal property through purchases. This means that there must be some capital for the purchase. My study demonstrates that many women lack access to capital and credit. Educated women can more often acquire property because their occupations result in higher incomes. Yet given the constraints women face in access to capital, credit and education, only few women are relatively able to acquire property.

The Interaction Effect

The relationship between education and property is particularly important when it is examined in the context of household decision-making. Women have control over household investment decisions pertaining to education, although they may not be able to influence government policy to gain access to

credit and inherited capital. Therefore, to gain access to physical resources and land, women strive for more education, gaining access to jobs with a significant income stream. Women are getting around the problem of uncertain control over household resources by converting limited physical resources such as property and income streams into human capital by investing in the education of their children, especially daughters. This is significant because a large proportion of the burden of education of children, the future labor force, falls on women. This strategy ensures the availability of the resources for the next generation. Although women in my sample projected that they would leave their property to children, when a woman precedes the husband in death, and dies intestate, the property often reverts to the patrilineage through the husband. Women, therefore, have limited control over physical resources and cannot ensure that they will get to their daughters. By investing in the education of the daughters, they endow them with a permanent resource whose benefits can be enjoyed over two or three generations.

Women are making rational calculated choices, since they have limited access to corporate property; they are giving more opportunity to girls to acquire education and thus private property. They are maximizing their investment by turning it into something that cannot be taken away. As structural transformation goes forward, human capital, in particular education, becomes a personal and national resource in comparison with land and other physical resources. Yet, often, due to lack of employment opportunities, the private returns to women's education are lower than those of men with the same education.

The choices that women make have an impact on the national development. Understanding the behavior of women in a rapidly changing context becomes very important for the success of government policies. Women are responsive to opportunities, yet at present women are not taking full advantage of education opportunities in Ghana. It is, therefore, important for the government to understand why women are behaving the way they are. There are now few employment opportunities for those with high school and college education, and even where they do exist, women do not always have the opportunity to use their skills and training. This lowers their returns to investment in education. Being rational decision makers, women will invest where they can maximize returns. It is not that women do not know the value of education or have no interest in it, but that they are strategizers and therefore maximize the returns to their investments.

To maximize productivity and ensure economic growth, the government needs to enact policies that will remove the constraints to women's access to employment, capital and the benefits derived from their investments.

GENDER AND NATURAL RESOURCE TENURE RESEARCH

APPENDIX II

List of Participants

List of Participants and Associated Departments

Name	Department
Carolyn Amegashie	Graduate Student, Public Policy and Administration
Marion Brown	Faculty, Agricultural Journalism
Linda Beck	Graduate Student, Political Science
Deirdre Birmingham	Graduate Student, Continuing and Vocational Education
Mimi Bloch	Faculty, Education and Instruction
Peter Bloch	Research Staff, LTC
Marion Brown	Faculty, Agricultural Journalism
John Bruce	Director, LTC
Colleen Calvey	Undergraduate Student
Françoise Crelerot	Graduate Student, Nutritional Sciences
Joanne Csete	Faculty, Nutritional Sciences
Carolyn Dean	Graduate Student, Continuing and Vocational Education
Jim Delahanty	Faculty, Geography
Elizabeth Diaz-Herrera	Private Sector, Small Enterprise Development
Carol Dickerman	Research Staff, LTC
Julie Fischer	Graduate Student, Geography
Nancy Forster	Staff, Latin American and Iberian Studies
Mark Freudenberger	Research Staff, LTC
Marilyn Fruth	Staff, Development Studies Program
Abdel Hamid	Graduate Student, Development Studies Program
Laura Hammond	Graduate Student, Geography
Narmai Hassan	Graduate Student, Sociology
Steve Hendrix	Research Staff, LTC
Sharon Hutchinson	Faculty, Anthropology
Don Kanel	Retired Faculty, Agricultural Economics
Phemz Karulanga	LTC
Rebecca Kemble-Nyoike	Graduate Student, Anthropology
John Kigula	LTC
Jeffrey Klenk	Private Sector, Disaster Response Programming
Steve Lawry	Research Staff, LTC
Stephen Leisz	Graduate Student, Land Resources
Tim Longman	Graduate Student, Political Science
Lynn Loofboro	Graduate Student, Land Resources Program
Dan Maxwell	Graduate Student, Development Studies Program

Laurie Taylor McGawn	Graduate Student, Continuing and Vocational Education
Russell Middleton	Faculty, Sociology
Ellen Nyahwihwiri	Graduate Student, Development Studies
Diane Pansky	Graduate Student, Political Science
John Peck	Graduate Student, Agricultural Economics
Beverly Phillips	Librarian, LTC
Andrea Robles	Graduate Student, Sociology
Lulu Rodriguez	Graduate Student, Agricultural Journalism
Michael Roth	Research Staff, LTC
Sharmila Rudrappa	Graduate Student, Conservation Biology and Sustainable Development
Suzanne Shoff	Graduate Student, Nutritional Sciences
Pamela Stanbury	U.S. Agency for International Development
David Stanfield	Research Staff, LTC
B.K. Sulanowski	Graduate Student, Agricultural Journalism
Annmane Terraciano	Graduate Student, Geography
Bill Thiesenhusen	Faculty, Agricultural Economics, and LTC Research Staff
Atsuko Ueda	Graduate Student, Economics
Monica Woldt	Graduate Student, Nutritional Sciences
Dena Wortzel	Graduate Student, Sociology
Crawford Young	Faculty, Political Science
Zongmin Li	Visiting Scholar, LTC

GENDER AND NATURAL RESOURCE TENURE RESEARCH

APPENDIX III

Workshop Agenda

****** THURSDAY, 3 OCTOBER 1991 ******

09:00 - 09:15 a.m.	OPENING COMMENTS Dr. John Bruce, Director, Land Tenure Center Dr. Susana Lastarria, Land Tenure Center
09:15 - 10:30 a.m.	INTRODUCTION TO GENDER ANALYSIS Dr. Kathleen Cloud, Facilitator; Director, Office of Women in International Development, University of Illinois, Urbana ▸ The conceptual framework, Part I ▸ The case study method and the first case study, "Upper Valley Resettlement Project, Southeast Asia" (Sections A and B) ▸ Small group and plenary sessions
10:30 - 11:00 a.m.	SMALL GROUP WORKING SESSIONS (Reading and discussion of the first case study, Section A)
11:00 - 11:15 a.m.	"WORKING" COFFEE BREAK
11:15 - 11:45 a.m.	PLENARY SESSION (Discussion of first case study, Section A) Dr. Kathleen Cloud, Facilitator
11:45 - 12:30 p.m.	PLENARY SESSION (Reading and discussion of first case study, Section B)
12:30 - 01:30 p.m.	LUNCH
01:30 - 02:40 p.m.	INTRODUCTION TO GENDER ANALYSIS Dr. Kathleen Cloud, Facilitator ▸ The conceptual framework, Part II ▸ The second case study, "Agroforestry Extension and Research: A Case Study from Siaya District, Kenya"
02:40 - 3:30 p.m.	SMALL GROUP WORKING SESSIONS (Reading and discussion of second case study)
03:30 - 04:20 p.m.	PLENARY SESSION
04:20 - 04:30 p.m.	CONCLUSION OF FIRST DAY

****** FRIDAY, 4 OCTOBER 1991 ******

09:00 - 09:15 a.m.	OPENING COMMENTS Dr. Susana Lastarria, Land Tenure Center
09:15 - 09:30 a.m.	INTRODUCTION TO PANEL DISCUSSION ON METHODOLOGICAL ISSUES OF GENDER ANALYSIS Dr. Michael Roth, Moderator; Research Staff, Land Tenure Center
09:30 - 11:00 a.m.	PANEL PRESENTATIONS First Presentation: Dr. Ruth Dixon-Mueller, International Development Education Association Second Presentation: Dr. Dianne E. Rocheleau, Associate Professor of Geography, Clark University Third Presentation: Dr. Cherub Antwi-Nsiah, Assistant Director, Office of Women in International Development, University of Illinois, Urbana Fourth Presentation: Dr. David Stanfield, Latin America Program, Land Tenure Center
11:00 - 11:15 a.m.	COFFEE BREAK
11:15 - 12:30 p.m.	RESPONSE FROM WORKSHOP PARTICIPANTS Dr. Michael Roth, Moderator
12:30 - 01:30 p.m.	LUNCH
01:30 - 03:00 p.m.	RESEARCH GUIDELINES AND POLICY IMPLICATIONS Dr. Marion Brown, Facilitator; Chairperson, Agricultural Journalism, University of Wisconsin-Madison
03:00 - 04:00 p.m.	REMAINING QUESTIONS/ISSUES AND CONCLUDING COMMENTS Dr. Kathleen Cloud, Facilitator

GENDER AND NATURAL RESOURCE TENURE RESEARCH

APPENDIX IV

Case Studies

TEACHING CASE: SECTION A

HOUSEHOLD STUDIES IN THE UPPER VALLEY AUTHORITY RESETTLEMENT PROJECT [1]

Early in the 1960s the government of Agricola undertook feasibility studies for construction of a dam on the Western River. The project had three major purposes; creation of hydro-electric power, increased food production, and increased income and quality of life for rural people. The country needed electric power for development and it desperately needed to increase food production for an expanding population.

The Western River rises in the mountains, grows in size as it flows through a widening valley in the foothills and finally flows through a coastal plain to the sea. In the upper end of the valley lived small numbers of farmers who used slash and burn agricultural techniques on the forested hillsides, and farmed small amounts of swamp rice on the flat lands near the river. At the lower end of the valley, one rice crop was grown on each year on small farms irrigated with water from the river. There was also some irrigated production of sugar cane on large government estates.

The studies showed that a construction of a dam was feasible in a mountain area where very few people would be displaced. Generation and transmission of hydro-electric power to the major industrial port city could be done economically from the site. With a stable water supply from the dam, the farms in the valley could produce two rice crops a year, and with the introduction of high yielding varieties could greatly expand the country's food production.

Satisfied that the project made sense, the government went forward, and by 1970 had completed a dam, and begun to develop the necessary infrastructure to support increased food production. Because the irrigable river valley stretches nearly forty miles from the highlands to the sea, development was done in stages.

Work began in the lower valley, where roads, schools, villages and government services were all in place. The major needs were for construction of new irrigation channels, and a consolidation of land holdings, which were very fragmented. Because competition for the irrigated land was strong, the government decided to end the sugar cane plantations, and to turn over this land to small rice farmers. Utilizing this additional land, the government was able to trade land among farmers, in order to make small irrigated parcels, which were then allocated to farmers already living in the area.

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[1] This case study is a synthesis of elements in the Mudu River Irrigation project in Malaysia, the Mahawelli Project in Sri Lanka, and the Nemow Case, by Ingrid Palmer.

Each household was assigned a two hectare plot of irrigated land and irrigation management groups were formed, and during the first two years contributed their labor to construction of the secondary and tertiary irrigation channel which actually watered their land. Over a 15 year period, each household was to repay the government a yearly fixed fee, and then would own the land free and clear.

There was, however, a regulation that the plots could not be subdivided for sale or inheritance, and no household could own more than five hectares of land in the project area. These regulations were intended to prevent a few farmers from acquiring large amounts of valuable land, and yet to preserve farms at a size which could be expected to support a family. These requirements were reasonable in terms of the government's long term goal of developing a class of highly productive small farms with a decent income level. Unfortunately, there was not enough land in the lower valley for all who wanted it.

This shortage produced an increasing demand for irrigated land, and the government, according to plan, then turned its attention to the development of the upper valley. Farmers from that area were encouraged to take up irrigated farming, and young farm families were recruited to move up river from the crowded lowlands.

The development of the upper valley was much more complicated than that of the lower. The people already living there were from a different ethnic group than the lowlander. They were a matrilineal hoe culture with different farming traditions, different skills and a different culture. Population densities were low in the area, there were few villages, and the only government services were a police station and post office. The only road was a single dirt track along the river.

Until detailed planning for the development of the upper valley began, planning and management of the dam and the irrigation system had been handled primarily by the Ministry of Public Works, but it was clear that resettling large numbers of people, providing a range of government services, and in effect, creating a new society, was beyond the capabilities of any one ministry. Because of the complexity, the government designated it an integrated rural development area, and created the Upper Valley Authority (UVA) to manage it. Twenty million dollars were borrowed from the World Bank as working capitol to assist in its development.

Face to face with the creation of new communities, and new farming systems, the UVA felt an acute need for information on how to make these communities function well, both economically and socially. Because there was very little experience to draw upon the UVA approached the University of Agricola, and asked it to form

a team of researchers to identify the areas of needed research, and to assist in its design and execution. The study was to begin with the arrival of the new households on-site, and to track the development of the farms, the households, and the infrastructure. The timing and quality of the necessary services was also to be examined. Because development was to proceed in stages, with a block of 5-7 new villages developed every two years, it was decided to study the first group of villages intensely over a three year period, and use the information gained to adjust the planning of the later villages. In the meantime certain assumptions were made, and plans were based upon them.

The arrangements for land tenure on the irrigated land were to be the same as in the lower valley. The UVA was to assign this land first to those living in the area, and then to migrants from the lower valley. As a result the farming of the two groups would be interspersed in each community. In order to save valuable farm land, homestead plots for a house and small gardens were assigned to each household in the lower foothills, and use rights to higher plots of red soils suitable for production of vegetables and spices were assigned yearly to women who applied for them. Higher land was to be used as common lands for grazing, gathering and fuel collection. While the local people could move their entire family onto the homestead if they wished, the migrants selected were all to be nuclear families with young children.

Each household would need a new dwelling, and many of the homestead plots would need clearing before construction could begin. Irrigation channels would have to be constructed, and many of the new fields would need to be leveled. The households would need some way of supporting themselves while this initial work was going on, as well as credit for the materials they needed. While the migrant farmers from the lower valley had some experience with fertilizers and high yielding varieties the indigenous groups had little, and indeed many of them had never farmed with an animal drawn plow. Yet in the short run, they were much better prepared to live on the land as it existed.

UVA planned to assist both groups in establishing themselves as farmers. Households were to be given food for work during the first year, while they built their own houses, and began the construction of secondary and tertiary earthen irrigation ditches. The government, meanwhile, was to construct the main, cement lined irrigation channels and to level farmers' fields utilizing skilled paid labor, and machinery such as back hoes and bulldozers. Building materials, plows and draft animals were to be made available to farmers on credit through the UVA at subsidized rates.

Credit and extention information were to be available through government sponsored cooperatives; each household was to belong to one.

A central office for the UVA was constructed, and staffed by professionals on loan from several ministries, including health, agriculture, public affairs and education. It was clear that roads, schools and health centers would also have to be built. The normal government procedure was to supply the materials, and have local communities supply volunteer construction labor. Given the other immense labor demands on the resettlement farmers, it was not clear whether such a plan was feasible in the upper valley. Whatever their construction, schools, health centers and extension offices would have to be staffed by professionals and paraprofessionals, who would also need places to live, and shops to purchase their daily necessities. Over time, the upper valley would need a private sector as well.

If you were a member of the research team, assigned to deal with your area of competence, in a three year study of the early settlements, what kinds of questions would you want answered? What methods would you use to arrive at the answers?

TEACHING CASE: SECTION B

HOUSEHOLD STUDIES
IN THE UPPER VALLEY RESETTLEMENT PROJECT

After fifteen years, the scheme was in many ways a success. A paved road ran the length of the valley, and buses provided daily service. The government had established three rural health clinics, and a system of village dispensaries which were well utilized. Each village had a primary school, and the older blocks had a secondary school as well. The early grades were well attended by both girls and boys, but as girls got older, they were less likely to attend.

Rice production, while not as high as had been projected, was substantial. Farmers kept what they needed for household consumption, and government agents purchased the rest for sale in the cities. Other crops, including maize, chilies, onions, spices and vegetables were also being produced, although there was no government credit, extension or marketing system for them. Outside traders created a brisk market for chilies and spices produced by women on their household plots, but prices for the women's fruits and vegetables were often low during peak seasons. A few of the older women took their produce on the bus to markets down the valley, but much simply spoiled.

Most families seemed to have a reasonable income, but a worrisome problem of child malnutrition persisted. Nearly thirty percent of the children had mild or serious deficits in their growth records. It was not clear to what degree this was caused by poor nutrition, and to what degree by diarrhea, but the clinics were recording increasing numbers of intestinal diseases among both children and adults.

The most difficult problem was increasing pressure on the land. Farmers were moving up the hillsides, the forests were nearly gone, and the resulting erosion was beginning to silt up the irrigation channels. Young people were leaving the communities in increasing numbers because they could not obtain land, and there was little rural employment.

To deal with the employment problems, UVA created a commission to study the possibility of attracting small industries. Among the possibilities suggested were a food processing plant, a brickyard, and a garment factory. The national government was also about to start a study on the increasing deforestation and erosion of the watershed, which was beginning to effect the water supply down river.

The University was asked to assist in the watershed study. They were interested, but argued that it would be more useful to do a study of the entire project in order to understand the larger forces at work. Utilizing the earlier studies as baseline data, it should be possible to understand how the system was changing, and why. UVA agreed that a more comprehensive study was a good idea, but both time and money were limited. They needed an industrial plan within a year, and a plan for preservation of the watershed within two years. It was decided to do a quick general study before any other decisions were reached. The University had two months to plan, and six weeks to execute the study, with another month to analyze and write up their findings before presenting them to the UVA. Given the short resources, if you were a member of the team, what would you do?

KENYA

AGROFORESTRY EXTENSION AND RESEARCH: A CASE STUDY FROM SIAYA DISTRICT[1]

HILARY SIMS FELDSTEIN, DIANNE E. ROCHELEAU AND LOUISE E. BUCK

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[1]What follows are excerpts from a case study authored by Hilary Sims Feldstein, Dianne E. Rocheleau and Louise E. Buck. This case study appears in its entirity in Working Together: Gender Analysis in Agriculture (Feldstein and Poats, 1989). These excerpts are presented solely for the purpose of discussion during the workshop on "Gender Analysis and Resources Tenure Research" sponsored by the Land Tenure Center, University of Wisconsin, Madison (3-4 October 1991). The Land Tenure Center is responsible for any typographical errors made during the reproduction of this case.

The LTC staff appreciates the assistance of Dr. Dianne Rocheleau and Ms. Hilary Sims Feldstein who gave us permission to edit their case study thereby allowing us to conform to our "unmovable time constraints". Also, thanks must be given to Dr. Kathleen Cloud who actually edited the original case and who subsequently guided workshop discussions of this case study.

Figure 7-1
Map of Kenya Showing Siaya District

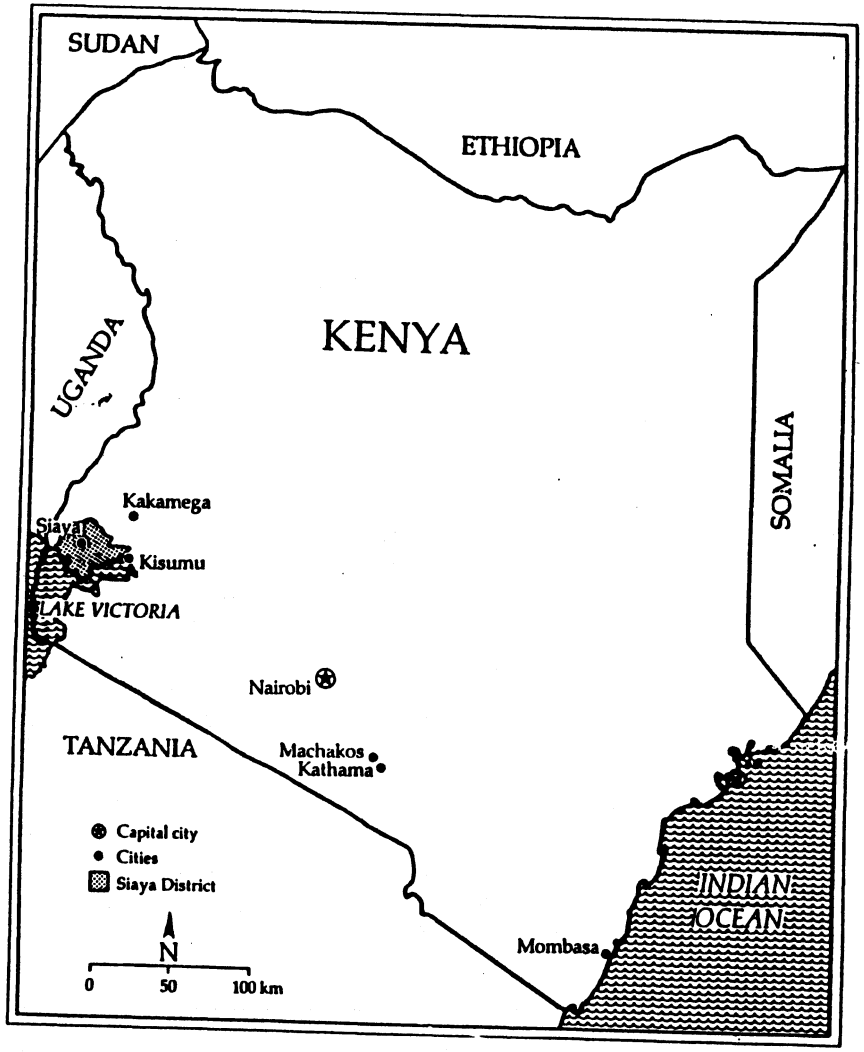

Figure 7-2
Map of Siaya District Showing
Agroecological Zones and CARE Assisted Groups

CONTENTS

** Note from the authors: This case was prepared as a basis for discussion rather than as an illustration of either effective or ineffective handling of a project.

KENYA

Area	584,000 km^2; 17% classified as medium or high potential for agriculture.
Population	15,327,000 (1979); growth rate 3.4%; rural population 87.6%.
Income	GDP/capita: Kenya shillings 2,800 (1980). Sources: tourism. Exports: coffee, tea, sisal, pyrethrum.
Ecological zones	Varied. Coastal belt bordering Indian Ocean, central Highlands, northeastern desert and semidesert, southwestern lakeshore.
Elevation	Varies from sea level to 5,199 m.
Rainfall	Variable by district.
Currency	Kenya shilling (Ksh). Ksh 20 = U.S. $1 (1985).

SIAYA DISTRICT

Area	2,000 km^2 centered on equator.
Population	474,516. Density ranges from 232 km^2 in Ukwala (north) to 143 km in Bondo (south).
Income	North: farming and remittances from off-farm labor. South: fishing, livestock, and farming.
Topography	Generally flat and undulating interrupted by scattered ranges of hills. Two main rivers, Yala and Nzoia.
Rainfall	800 mm on shores of Lake Victoria to 1,800 mm in north. Patterns: long rains--March to June (sustained). short rains--August to November (short burst)
Elevation	1,140 m at lake shore to 1,440 m in hills.
Temperature	North: cooler, two-crop system. South: one crop.
Soils	Extremely variable; widespread low fertility and poor drainage. Lake shore: heavy, poorly drained clays (Blackcotton or vertisols); Central south: sandy soils; North: well-drained red loams.

KENYA: PART 1
PLANNING

"This is a great opportunity to put into practice our ideas about community participation and combining extension with research." Anna leaned back at her desk and smiled at her friend who was doing research at the International Council for Research on Agroforestry (ICRAF).[1] David had been pleased to hear that Anna had been asked to develop a plan for CARE Kenya[2] to run an agroforestry project in western Kenya.

"Let me give you some background," said Anna. "As you know, there was a terrific response to the president's tree-planting campaign. As a result, the Kenya Forest Department has begun to modify its emphasis on plantation management for timber production and is developing a rural afforestation extension scheme. However, it does not yet have the capacity in extension or seed production to meet farmers' needs. Up to now, they have relied on nongovernment organizations like CARE to propagate and distribute seeds to the groups with which they work. But this has been on a small scale. Now, the Forest Department and CARE want to develop a district-wide scheme, and the Forest Department wants a model for their own rural extension service. CARE is interested in the provision of fuelwood for subsistence level farmers, something which would benefit farmers as well as slow local deforestation. The overall objective is to improve rural welfare in Siaya District through tree planting. To do this, the project goals are to learn what species and what planting arrangements or configurations are suitable for different environments in Siaya to reduce more seeds and seedlings, and to train personnel for working with farmers. Parallel to this CARE will be introducing those great new cookstoves which are so efficient."

Simply put, agroforestry technology consists of three elements: trees, crops, and livestock (the components), location and arrangement, and management. Agroforestry research focuses on the interaction between trees, crops, and animals, what arrangements, and what kind of management are most beneficial to farmers and herders and fit within their farming and livestock production systems?

Agroforestry research is both biological/technical and socioeconomic, reflecting the need to understand how trees fit into existing farming systems. Biological research involves exploring the technical parameters of different species--requirements for their growth (soil, water temperature, spacing, etc.), outcomes of different management, their uses or products, and their effect on their immediate surroundings in terms of complementing or competing with other plants or animals. Such research has involved on-station and on-farm trials. Research on alley cropping has included trials between and within row planting densities, different species combinations, and management for different uses

such as mulch or fodder. Measurements are taken of the yields of both crop and trees.

Because of the potential in agroforestry for different outcomes, a central issue for socioeconomic research is an understanding of what products or services farmers want from trees. Other factors affecting the acceptability of agroforestry technologies are questions of land and tree tenure or access rights and the availability of labor for optimum management. In some environments, the benefits of alley cropping have been reduced or negated by shade on crops because farmers did not have time to prune or coppice the trees.

Diagnosis and Design (D and D), was a methodology which ICRAF was developing in order to understand the farming system and to identify promising interventions. D and D took a problem-solving approach, usually focused on the individual farm as the management unit and on individual heads of household as farm managers. D and D was designed for high-level research teams to carry out under time constraints, and it usually involved a small sample chosen by the researchers. The purpose was to gain general descriptive information about the farming system: the typical division of labor, ownership and interests; the main problems faced by farm households and those amenable to agroforestry solutions (at least in part); and a feel for the general expression of these problems at the farm level. Such a diagnosis provided the basis for recommending experimentation with specific agroforestry interventions. The method is iterative, with constant feedback from trials into revised diagnosis and design of new agroforestry practices and/or new trials. David was eager to see this methodology used in a more extension-oriented setting.

David said, "Tell me what you have been learning in the Mazingira project about working with groups."

Anna answered thoughtfully. "Well, as you know, we originally set up new groups with the idea that they would start nurseries and together have a demonstration plot. We were trying a number of interventions with both indigenous and exotic species. Alley cropping and border plantings with fast-growing, multipurpose trees were the most common. We are trying anything we can get which is known to provide fuelwood and not harm crops. **Grevillea robusta, Cassia siamea,** and **Leucaena** are most common, but we are trying many more. Now in each nursery, many different varieties are being grown and we are planting the best seedlings with farmers' crops. But there wasn't much sustained interest. The community plots really didn't go. Instead we are now working with individual farmers. Our field workers are walking with them over their land, developing maps, and then designing trials which fit each farm. We have about eighteen trials going now. This fine-tuning of farmers' own agroforestry systems to accomplish their own objectives within their own constraints is attracting much more interest, and we are learning more about the potentials and constraints of agroforestry. We've been monitoring them regularly and have a pretty good list of

what species grow best in each zone. We've continued looking at both indigenous and exotic species and are beginning to get some ideas about which new (noncustomary) species may be substituted for known species, but provide better benefits through faster growth, better versatility, or less competition with crops."

"We have not yet done group interviews, but are planning to at the end of this season, evaluating the experimental plots. We have found that fast-growing legumes, such as **Leucaena**, have enormous appeal to farmers because of their fast growth and what they have been told about nitrogen-fixation. **Leucaena** does grow fast, but so far no plantings have been as bushy and fast growing as the ones we've been told about from the Nigerian experiments. **Grevillea** is also very popular since it produces poles without interfering with crops. Indigenous trees are not very popular, in large part because they are not new and farmers see little reason to plant them: 'They grow by themselves'."

David nodded, "By meeting with the groups and with individual members, we have learned a lot about different niches for the planting and use of trees. Apparently, for fuelwood and fodder there is liberal access to trees in such places as public and semipublic grazing lands and along roadsides. Even on private lands, nonowners have some access rights. This is often the main source for poorer, often female-headed households. This was new information to the researchers carrying out trials with individual farmers. She also told me another story about this area. Three of the men farmers doing trials were raising their own seedlings, but women in their households were collecting and transporting the water. During the drought, they put their feet down and refused to transport water for seedlings from the only water source which was over two kilometers away."

"Hmm. Water is always a problem," Anna replied. "I am undecided about whether to begin with groups which already have nurseries, or to start new ones. The Mazingira groups were mixed, but most of our farm trials have been with men farmers. We found it extremely difficult to get information about fuelwood availability. The field officers and I have talked about this a lot and now are making a special effort to ask women about fuelwood--and we are getting some answers. Men clearly weren't interested. Now if you ask them about timber, or poles...."

Anna grimaced. "Right now I have more questions than answers. We are committed to working with groups, but what kinds of groups shall we work with? What are we going to provide to groups in terms of materials? In terms of technical assistance? What can we offer in terms of advice? There seems to be a strong interest in nurseries in the district, but they mostly grow timber trees--eucalyptus and cypress (**Cupressus Iusitanica**), which is the only seed they get from the Forest Department. Also, citrus is being promoted by the Ministry of Agriculture and some men are growing it in orchards. Will they be interested in other kinds of trees? Or in planting arrangements other than wood lots? How can we interest

people? How can we make sure women's access to fuelwood is improved? Whom should we use for our field officers? What should be included in their training? One problem we are having in Mazingira is that both farmers and field staff focus on nurseries and tree species and do not think much about arrangements and how different configurations fit with objectives of different groups in the community."

"We had the opposite experience at Kathama," remarked David. "The research with individual farmers focused on the demonstration and refinement of a very specific arrangement, alley cropping **Leucaena** or **Cassia** with maize and pigeon peas. The farmers experienced a restricted choice between species and lack of experience with propagation. In fact plant propagation and establishment became major problems for ICRAF researchers as well. Because of the difficulty of getting food seedlings and plant establishment, there has been only limited progress on their alley cropping experiments. The farmers have now taken a detour into nursery activities in order to gain more skill and experience with raising and planting a variety of species. Most farmers are used to trees in forests as a source of free goods. But conditions are changing and there is a need for more know-how on plant propagation and management."

"It is important to get trees into the ground," Anna observed, "but it is more important to make sure that the varieties chosen and the arrangements are truly beneficial and don't waste people's time or have negative effects on their crops. The challenge of this plan is to continue to experiment based on diagnosis at the local level. I know we don't have a proven package. On the Mazingira project we have learned that there is a very wide range of problems, needs, farm configurations, levels of interest, and resource commitments, etc., among households. Extension must be tailored to needs of specific areas and household types. So we need to do research as well as extension. The Kenya Forestry Research Institute (CEFRI)[4] has agreed to carry out trials."

"What you learn there could be useful to ICRAF as well," David declared. "We are finding at Kathama that some farmers, the men doing trials and some of the women from the groups, are taking some of the species we've introduced and are planting them differently, or taking their own species and planting them in our recommended patterns. Some of their experiments are quite interesting. For instance, the original plan called for the classic alley cropping recommendation of using **Leucaena** and **Cassia** for mulch. Instead, they used biomass from fencerows and dispersed trees and put it in cow pens, a sort of precomposting, before putting it on cropland. In cropland, they planted fruit trees or used the multipurpose trees for fodder rather than mulch. In general, women wanted fruit and fodder trees in their nurseries. Alley cropping as it was originally set up in our experiments has nearly disappeared."

"David, do women plant trees in Kathama? I have heard that only men plant trees in Siaya, but we haven't found that elsewhere."

"Women do plant trees in Kathama," David replied, "although it was traditionally a few men who started nurseries and learned horticultural techniques. The recent project activity has made this knowledge available to most women in the community and they use it. However, there was no strong taboo against tree planting by women. We worked with individual women whose husbands were away on wage employment. They usually needed to consult with their husbands about whether and where to plant any introduced trees. Now in Kakamega, just northeast of Siaya, there do seem to be such strong beliefs, but some species which grow low and bushy such as **Sesbania sesban** are considered women's shrubs' and women harvest them regularly. The real resistance is to women planting commercially valuable timber or fruit trees. Well, I must go. I will think about an experimental program. Let's talk next week. Good luck with finishing the plan."

After David left, Anna reviewed the information she had on Siaya District and the reasons that CARE and the Forest Department had picked Siaya. The district had a high energy demand and the potential for serious deforestation. Farmers were seeking assistance in tree development, and the district forest officer had demonstrated great enthusiasm for decentralizing seedling production to small-scale nurseries, within closer reach of more farmers. Here there was momentum to build upon. Finally, there were many local nongovernment organizations and community groups, but the district was not overly full with assistance from other donor agencies.

Siaya presented a wide range of agroecological conditions, which constituted both an opportunity and a challenge to the agroforestry project. Soils were extremely variable, with widespread problems of poor fertility and inadequate drainage. The district's complex mosaic of landforms, soils, and climate was traversed by two main rivers (the Yala and Nzoia) and numerous small streams. Together with the Yala Swamp and over 100 kilometers of lakeshore, these features constituted one of the great resources of the district. The availability of water from rivers, swamps, or lakeshore could be a major advantage in tree planting, although waterlogging of soils might also limit tree planting and cropping activities in farmlands near water.

The natural vegetation in this landscape ranged from remnants of tropical rainforest in the extreme northeast to riverine forests, swamps, and dry acacia woodland in the south. This represented a large pool of local tree and shrub species to choose from, although little was known about most of them in forestry circles. Moreover, many of these species were disappearing, since they could not reproduce naturally under current conditions. Most of the trees in Siaya District were scattered as isolated individuals or swamps in grazing land, cropland, and homesteads.

Both natural forest and swamps were under heavy pressure from harvesting of timber and papyrus, respectively, as well as a strong tendency toward conversion to cropland. There was in fact a clear case for growing trees on farms in most parts of the district, across all of the ecological zones.

The higher potential, cooler and wetter zones in the north had two cropping seasons and could produce crops such as coffee, while in the south farmers struggled to raise a single crop of sorghum and millet, with perhaps a little cotton for cash. While residents of northern Siaya relied almost exclusively on farming and remittances from absentee men employed in cities and tea and sugar estates, the people in the south mixed farming with fishing and/or livestock production as major activities.

One of the most striking differences between the northern and southern extremes was the density of population, intensity of land use, and size of landholdings. In the north most of the area was occupied by cropland plots of 1 or 2 hectares, separated by hedges and occasional pastures. Trees were found on fencelines, in home compounds, and along stream banks, with a few scattered in croplands. In the drier south, cropland plots of 1 to 5 hectares were scattered within the large tracts of pasture, fallow, and occasional patches of dry woodland. Aside from the woodlands, trees were also scattered throughout the grazing land, were fairly concentrated in home compounds, and appeared as isolated or irregularly dispersed individuals in cropland. According to George, the district forest officer, the scattered trees in croplands or fallowed areas were either left after bush clearing and tolerated for their by-products, or resulted from spontaneous regeneration.

There were very few free trees left in the north except for roadside shrubs which were heavily used by women for stickwood and fodder. Timber, poles, craft wood, and even high quality fuelwood were all commercialized due to the relative scarcity of large trees or preferred species in the landscape. Large, old multipurpose trees which used to provide abundant pods for fodder were being cleared for a single purpose, charcoal. Planted cypress and eucalyptus were common in small lots and on property boundaries. In the south, especially in the lakeshore communities, the demand for fuelwood to smoke the commercial catch, Nile perch, placed heavy pressure on the same land and trees which supplied the fodder requirement for livestock (cattle, goats, sheep). These open lands also constituted the frontier for expansion of cropland. While there were still more free trees left in the south, the environmental conditions were much harsher, so the deforestation would cause more serious damage to soil and water resources and it would be more difficult to grow new trees. (The traditional agroforestry practices which Anna observed are summarized in Appendix 7-C.)

In Siaya District, land was adjudicated and registered, usually to the male head of household.[5] Almost all land was privatized and fenced in the north except for hilltops and swamps owned by county councils. Some clan elders also held private grazing lands or water access points which were used by other clan members. By contrast most of the land in the south, except for cropland, was not fenced and was open to shared use for grazing and gathering, even if it was officially private property. Cattle, sheep, and goats also wandered freely through the landscape outside of the cropping season, which was a major constraint to tree planting.

Because the Forest Department was interested in what could be learned about extension from this project, Anna had interviewed people in each of the government extension services serving rural areas to find out what their field officers did, what training they had, and whether there were women extension officers. The Forest Department and rural afforestation extension workers had two years postsecondary education and were familiar with timber species, but had little or no training in agriculture or agroforestry. There were no women in the Forest Department extension service. The agriculture extension staff included both men and women. They had two to three years of postsecondary training, all in agriculture, with a little training in communication skills. The extension workers of the Home Economics Division within the Ministry of Agriculture, all women, also had two or three years postsecondary training, with at least half of their program in agriculture. Community development workers from the Division of Social Services were also all women and had been trained to the B.A. level. They had little formal training in agriculture and none in forestry.

NOTES

1. The International Council on Research in Agroforestry (ICRAF) was established to undertake research on agroforestry practices and on species which could be incorporated into farming systems. For one year it ran a Kenya Agroforestry Tree Seed Project to identify and obtain tree seed appropriate for use in agroforestry projects designed by ICRAF with collaborating Kenyan institutions.

2. CARE International in Kenya (CARE Kenya) is a nongovernment organization which provides assistance to community development. Previous to the Siaya project, CARE Kenya provided financial assistance and project personnel to the ICRAF-sponsored Kenya Agroforestry Tree Seed Project and the Mazingira Institute's Agroforestry Plots for Rural Kenya Project. Other CARE activities in ten districts in Kenya are improvements in water supply, women's income-generating projects, primary school assistance, and assistance to youth polytechnic institutes.

3. The Mazingira Project was a joint project of the Mazingira Institute (a private consulting group which focuses on social research aimed at low income populations), CARE Kenya, the Mennonite Central Committee, and ICRAF. It was intended to examine the potential for promoting agroforestry land-use practices among small holder farmers. This was to be done through collaboration between local, nongovernment organizations and external nongovernment advisory organizations. It was the first effort to have the scientists, ICRAF, provide technical assistance to community groups.

4. When the CARE project began, agricultural and forestry research were both done under the auspices of the Kenya Agricultural Research Institute (KARI). This was later split into two institutions with forestry and agroforestry included in the scope of work of KEFRI. We have therefore used KEFRI throughout the text.

5. Since the late 1950s, much of the land in Kenya which was originally held communally has been measured, adjudicated, and registered to individuals as private property. The replacement of traditional communal property rights by private ownership has been accompanied by an erosion of the traditional responsibilities and protections of men and women. Women, particularly those widowed, divorced, or less favored wives, are especially vulnerable, since the absence of a husband or a husband's disfavor is not balanced by an enforcement of traditional rights.

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TABLE 7

Benefits of Agroforestry Systems

JOBS AND INCOMES	HOUSEHOLD AND FARM USE	ENVIRONMENTAL EFFECTS
Fuelwood and charcoal	Fuelwood and charcoal	Erosion control
Poles and logs	Building poles	Soil fertility
Gums, resins, and oils	Fodder and forage	Flood and landslide prevention
Commercial food products	Fruit, nuts, and honey	Water availability
Pulpwood	Agricultural uses:	Shade, protection from wind & rain
Sawmilling, carpentry, and handicrafts	Mulch Soil fertility Shade for animals and crops	
Medicines	Fencing	
Mushrooms	Thatch	
Crafts, utensils	Weaving materials	
Wildlife, leaves	Medicines	
	Ornamental	
	Food and spices	

KENYA: PART 2
THE FIRST NINE MONTHS

David sat in the shade of the **Albizia coriara** tree under which people had gathered for discussion for many years. Its extensive leafy branches made a cool retreat from the hot sun. In front of him was the Nyasanga group's community nursery. At the moment five women, whose shift it was, were bringing water from the nearby stream and watering each seedling. Others were pricking out emerging plants from pots where more than one seed had germinated and were planting them in empty pots. Later in the afternoon, the CARE field officers would conduct a meeting with all the members of the group. The practice of arranging meetings to coincide with regular work days had resulted in good attendance of working members. As David rested he thought about how the project had started and how far it had come since his conversation with Anna nine months previously. He was now the project manager, and four field officers had been trained. Three months ago, nine groups began growing CARE seeds, sometimes in the corner of a nursery devoted primarily to timber species, and they would soon be planting out seedlings.

David was particularly pleased with how well the field officers were working with community groups. Mindful of the need to create a model for the regular Forest Department extension service, Anna had decided to experiment a bit with what made a good extension officer and what minimum education level was necessary. She had interviewed a number of people and had selected those who showed leadership skills and who had a variety of ethnic and educational backgrounds. James was a government extension agent who had worked with David in Machakos and had a three-year postsecondary diploma in agriculture. Francis had graduated from a secondary school with an agricultural curriculum and had spent two years doing extension work with a commercial firm. Joyce was a teacher with a home economics diploma. Robert had been a CARE field officer who had worked for a year on the Mazingira project.

The training program had been carefully designed to make the field officers critical analyzers of any kind of development effort. Anna and David wanted the field officers to recognize that they weren't experts, and that they needed to find out what the problems were and be problem solvers. To do that they needed diagnostic and interviewing skills as well as information about agroforestry technologies. The training had begun with hands-on work at the nurseries of the Mazingira project with a particular emphasis on record keeping. This included documenting seed collection and supply, seed treatment and management, storage, and when planted. They also tried out and discussed ways to keep groups motivated about their nurseries.

In conjunction with the hands-on experience at the nurseries, the trainees did classroom work on Diagnosis and Design (D&D), carefully taking apart each step of the D&D methodology, and they learned about different components (species and varieties) of agroforestry systems and about their arrangements and management. They learned to do farm sketches and diagnosis and how to follow up after planting. They practiced interviewing with role playing, eventually interviewing the trials farmers of the Mazingira project. To give them experience with groups, David had taken them to Machakos for a week. He had taken special pains to make sure Joyce was treated equally as a full member of the team. He insisted during that week that all the chores of housekeeping be rotated among the team members, leaving them no chance to leave Joyce with all the cooking and cleaning. The group interviews at Kathama were extremely productive. Once the team learned to make special efforts to ask questions of women, they learned a wealth of information about indigenous trees and uses.

For three weeks the group traveled to a number of tree projects, visiting large- and small-scale nongovernment organizations, individual, self-made innovative farmers, and school teachers who were well connected to communities and considered community leaders. This was to help the trainees learn about different project approaches as well as add to their inventory of possible interventions. Finally, they made a field trip to Siaya. Anna had held off on picking groups and had asked the trainees to interview a variety of groups and take part in selecting them. They had spent ten days interviewing local groups within each of the four categories. They were to look for groups which met these criteria: proximity to water sites and to a demonstration site, group provision of building materials to provide shade, secure tenure for site, evidence of group stability, high motivation, and willingness to meet the project's terms of assistance which would include a lot of interviewing. The nine nurseries chosen represented diversity in agroecological zone and group organization. One was a school group and two were chief's groups; all three had begun tree nurseries from which seedlings were sold. Six women's groups were selected--they had come together for various purposes: community gardens, labor exchange, crafts, or cooperative marketing.

Traveling with an expert on indigenous trees, the trainees had spent ten days touring the district, identifying indigenous species and current agroforestry practices. They learned that in Siaya planting was identified with new trees, usually timber species or fruit trees. Indigenous trees were viewed as something already there, to be used or managed.

The final week of training had been on formal communication skills. This was done to reinforce the idea that extension in this project would not be top-down. Farmers were to be recognized as knowledgeable about their own practices and as already practicing agroforestry. This was a distinct shift from earlier practice

where D&D had been used to learn about farmer circumstances, and that information used to design agroforestry technologies to be brought back to farmers as something new. Training also focused on techniques which would help ensure an equal voice for women and included role playing with each other, pretending to be shy women or outspoken men, or wealthy versus poor farmers. The implementation plan called for working with local groups to accomplish the following:

1. Identify needs for trees in their area (diagnosis),

2. Select appropriate species and general configuration (design).

3. Select with individual farmers good locations and configurations on their farms for planting trees directly (on-farm design).

4. Establish and manage nurseries for raising the selected species.

5. Establish demonstration sites near nurseries.

6. Develop appropriate tree management practices.

7. Monitor and evaluate activities and tree and crop performance, including participant judgment as a basis for modification or redesign.

The seeds given to the nurseries during the first season were chosen on the basis of Mazingira project experience: species that were popular in those project environments and which seemed suitable for the respective zones of Siaya, and species for which seed was available (see Appendix 7-1). The earlier inventory of indigenous species was taken into account. The established nurseries often had received timber and fruit tree species earlier from the Forest Department.

At the beginning of the year, the nurseries were given their materials and the field officers trained them in good nursery practices. The initial package of support consisted of funds for a guard, a wheel barrow, watering cans, a hoe, a rake, polybags for seedlings, and tree seed. Emphasis was on self-management of the nurseries rather than leaving them to a paid caretaker. Working through groups seemed to have been a good choice, since there were many well-organized groups in Siaya and there was not a tradition of raising seedlings on individual farms. Soon the first seedlings would be ready for planting out and extension team members would begin making regular visits to members of these groups to assist in on-farm design and management. David estimated that most nurseries would have one thousand to two thousand CARE seedlings for planting out.

The nine nurseries had been established as concentration areas within each zone. The results of the trials and the D&D and extension done with these groups would be the basis of the technical packages provided to nearby groups.

David and Mary (his colleague from ICRAF) and the field officers were conducting interviews with each of the nine groups so that the project staff (and ICRAF) could develop a general procedure for diagnostic interviews with community groups. In previous diagnostic work by ICRAF and CARE, community interviews had come much later in the process. They hoped to get a good description of the existing system and how it worked and to identify land use problems that might be solved by agroforestry interventions. This format would allow the team to poll group members about types of trees and planting niches already of interest to them, and it would spur discussion among the clients themselves about some of the issues raised.

David read over his notes from the seven groups that had been interviewed so far (Appendices 7-E and 7-F). Several things were already evident: men and women had different knowledge, different ownership and access, different tasks, and different uses for trees. Men were interested in fodder and building poles, especially for sale; women in fuelwood; both in soil improvement. Some groups, particularly in the north, high potential area, were primarily interested in nurseries for income generation; that is, in selling popular seedlings such as **Eucalyptus** or **Citrus** for cash. Near the lakeshore there was a high demand for fuelwood for smoking fish. People bought fuelwood, or, if they wouldn't afford it, used shrubs or **Euphorbia**. Women paid for it with their own money or with money from remittances. Some, but not enough, fuelwood was available on the roadside. In the diagnostic interviews, men were readier to speak up than women. The field officers were able to offset this by directing their questions to women, asking questions about which they would have special knowledge, or by approaching them with questions later when they were alone.

In the discussions and pooling of notes which had followed, the team had noticed that it was ranking, rather than defining, the problems that divided people more sharply. In many cases men and women recognized each other's problems and would mention them if asked specifically, or would accept the others' point if it was raised, but they usually disagreed on the relative importance of some problems and their solution. Overall, both men and women agreed on the need to improve yields, expressing an indirect concern for soil fertility and overall soil condition. At the end of the interview, group members indicated where trees could be planted and what species they would like to plant. The groups often chose the popular forest department species such as **Eucalyptus spp.** and **Cupressus lusitanica**, or the new trees, such as **Leucaenea** and **Gliricidia sepium**. The group interviews had confirmed the active use of a number of indigenous or naturalized trees and a strong interest in fruit trees.

David's notes indicated that the main gender issues to surface were whether women could and would plant trees, whether they could own the trees or use their products (whether the trees were planted by them or not), and which types of trees they would like to plant. During the interview at Ginga, the group members replied almost unanimously that a man (head, son) would plant the trees and would be considered the owner. When the women were questioned further about how this would affect their access to the trees and tree products, the women found this to be a strange question. Mary had recounted to them the experience of some women in a neighboring district who had helped to raise and tend trees planted and owned by their husbands or sons. They were denied access to the trees for coppiced fuelwood, since the men were keeping the trees for building poles, and the species and management practice did not provide much at all in the way of fuelwood by-products. The question therefore was whether these women felt that planting and ownership by men could result in such a situation. An elderly woman leader immediately replied, "One would not cook for such a man," to which first the women and later the men nodded in agreement. One of the elder men said, "That would be just." The team had agreed to let the question rest in the capable hands of the Ginga community without further concern for the moment.

In Nyasanga, where both men and women were farmers but where there were many absentee men and a clear division of responsibilities between men and women when both were present, these differences surfaced in the voting on priority farm needs. After listing all of the problems and needs that might be addressed by agroforestry technologies, the group had voted for their top-ranked choices. While everyone seemed to agree on declining crop yields as the number one problem, some controversy arose over the importance of fodder. The team had noted the apparent disagreement between some group members, and James (the discussion leader) had continued on to the next item, fuelwood. When nearly all of the women present registered their vote for fuelwood as number two, several men objected, accusing them ". . . but you promised to vote for fodder." Aside from being pleased that the whole topic of trees had aroused such fervent participation, the team had noted the division of interests, the attempt by the interested men to sway the women's choice, and the women's response, an independent vote. At a later interview in Ugege, the team had found a similar division of interests between women's interest in fuelwood and men's in fodder.

On the basis of the interviews and their own observations of what farmers did, the field team had decided that the most promising approach toward introducing agroforestry practices was to help farmers regularize current practices and do more planting in specific, complementary spaces. For the first season's on-farm planning with individual households, they decided to focus principally on (1) lines of trees, either living fences for protection of crops and fuelwood or boundary markers for poles or doffer and (2) alley cropping for mulch, fuelwood, and soil

fertility, using the species available in the nurseries (Appendix 7-G). These packages would be the basis of the trials being conducted by KEFRI to establish the technical specifications appropriate to different zones.

The sharing of work and training as well as ownership of land, trees, and their products was still troubling Mary. She wanted to be sure that the project would introduce agroforestry technologies and would make plans that would be practical for women to manage for their own benefit. The project's approach would also require a better sense of local land and tree rights, both rules and practice, at the household and community level. Between rounds of group interviews, Mary brought up the question of the division of labor, access to resources, and control of resources between men and women.

David had very few answers, but he had just hired a young woman sociology student on vacation from the university. "Achola is from Siaya and she's expressed an interest in more in-depth social research on agroforestry technology development and extension in the district. Let's see if we can arrange for you to meet with her this afternoon. She ought to have some leads for you on these questions."

After Mary explained her interest in women's access to land and trees, Achola thought for a moment. "Under the law, on paper, the men own all the land and all the trees. But let me tell you how it really works: with a mix of traditional rules and changing practices. Most rural people live in extended family compounds, owned and managed by one man, with separate spaces for homes and fields allocated to each of his wives and later to their sons. Eventually some of the sons may move to a new site and build their own compounds while some remain on their father's compound and inherit their own portion of the holding through their mothers. The exact sequence is a little complicated, but for us the important point is that any married woman or widow on the compound has rights to reside their in her own house, rights of access to a plot of cropland for farming, and rights to gather tree and other wild plant products from her plot or from the main fences, grazing areas, and communal lands subject to her husband's, son's, or father-in-law's permission. The actual products, and particularly the harvested grain from each woman's field, are her own property. She can sell, store, or use them as she wishes. The only thing is, she's responsible for feeding and educating her own children, so it's important to get a surplus if she also wants to sell some for cash to pay primary school fees."

Mary looked puzzled. "Hmmm . . . this is hard to picture. How does it look on the ground? Can you sketch a typical farm for me with men's and women's land, trees, and produce?"

"Sure," replied Achola. "Here's a compound with one elder man, his three wives, and two married sons--sons number two and three. The first son does not reside here as he must go to start

a new compound elsewhere. The last son, the fourth, will be the one who stays permanently. (See Figure 7-3.) This is one version of current practice, a change from previous tradition. This will give you a general idea."

"That's pretty clear." Mary was relieved that the picture gave her a good visual grasp of spaces where trees could be planted.

But Achola hadn't finished yet. "Now remember that the man owns and allocates the land, so each woman's fields may change in size and location as the elder man or his sons take new wives."

"Whoops . . . ." Mary continued her questioning. "So what happens if a woman plants a citrus tree in her plot and the plot changes after the tree has matured? Who owns the tree?"

Achola responded quickly. "Mostly women don't plant trees, especially valuable trees for commercial products like coffee, timber, or exotic fruits. Probably her husband or son would plant it. But no matter who plants it, the tree is on the headman's land and it's a permanent thing, and a valuable one at that, so it's the man's property. But don't let that get in the way. The fruit would probably belong to whomever had managed and cared for the tree, if he or she continued to do so. Now if the women wanted to cut the tree down and sell it for charcoal, that's a different matter; she's have to ask the man's permission."

"What about some of these small trees in hedgerows? Or shrubs used for fuelwood, mulch or fodder? If a woman were to plant them or to have her sons plant them, would she need permission to cut them? On her cropland? On the boundary of her own plot? On the outside boundaries of the compound? Around her own house?" Mary paused in writing her notes.

"It will vary from one case to another," answered Achola, "but I'll tell you one thing: the men in the household, especially the headmen, are going to have the most to say about where new trees can go and about who can use any existing trees in new ways. They may want to try out anything new on their own plot, which is worked by all of the women in the compound. Or, if they're skeptical about this, they may wish to limit new trees to spaces where there is little risk of interference with crops." Achola paused. "But tell me, Mary, what difference does all this make to the agroforestry project?"

"Yes," said David from the doorway. "How will this help us?"

"Maybe a lot." Mary spoke with conviction. "Ownership or secure access are usually important prerequisites for tree planting on a large scale. There could be two problems in the case: one is that if women don't feel secure enough about control over benefits, they may not plant, except for a few scattered trees here and there. The other possibility is that they do invest lots of time

and effort in planting and then lose control of the benefits. This is less likely at the lakeshore where men's and women's work is still complementary. Or maybe the women plan their nursery work with one arrangement in mind and the men have a different idea which isn't compatible with the species already raised and ready to plant . . . . I'm worried about how the women in the nursery groups get from raising seedlings to having their own trees (or control of their own tree products) on the farm.

"What you've explained, Achola, may be worth a closer look. And I think that the field staff are going to face some tricky situations when they get to planting at the farm level. They'll have to deal with women's spaces (which are pretty limited) or with the nesting of women's plants and women's products into plots, and with planting arrangements under men's control. From what you said about the men's own fields, it sounds like women's control of their own labor and that of others can also be subject to prior demands from the senior men. Widows, wives of headmen versus sons, and senior versus junior wives may all have different constraints and opportunities in terms of planting places, arrangements, and management. And of course many people also now live in single family compounds, and their approach is bound to differ from the more common traditional situation you've just described. Gone are the simple days of interviewing the farmer. These field workers may need to know more about negotiation and less about trees."

"Okay," said David. "But remember, this project is not only for women. Agroforestry and trees have benefits for both men and women, and what we are concerned with is improving family welfare as well as stopping deforestation. Still, I can see we're going to have a tricky transition from group nurseries to on-farm agroforestry practices, since both the actors and their roles will change. Let's think about what this means for the content and style of our farm level operations. In the meanwhile, let me introduce you both to Grace, a teacher who has done tree-planting projects in schools with both boys and girls."

Mary and Achola explained to Grace the project's concern about how to work directly with women in a situation were women's participation in tree planting might be limited. They had heard from the foresters that Grace herself was quite an active tree planter as were some of the girls in her school.

"It's very true that this taboo exists against women planting trees," Grace said. "You can't ignore it. Some people believe that it will bring bad luck and besides that they consider it to be inappropriate, much as building a house or doing other men's tasks is. But remember that it also used to be considered inappropriate for girls to go to school, or for women to teach school, like me. When I do tree-planting projects, I give the girls an opportunity and an example and I don't push. Lots of girls eventually join in, while others may limit their participation to the nursery work, which does not have this label as a man's job."

Mary wondered if this experience was typical. "But to what extent is the flexibility of some of your girl students due to their age and their level of education?"

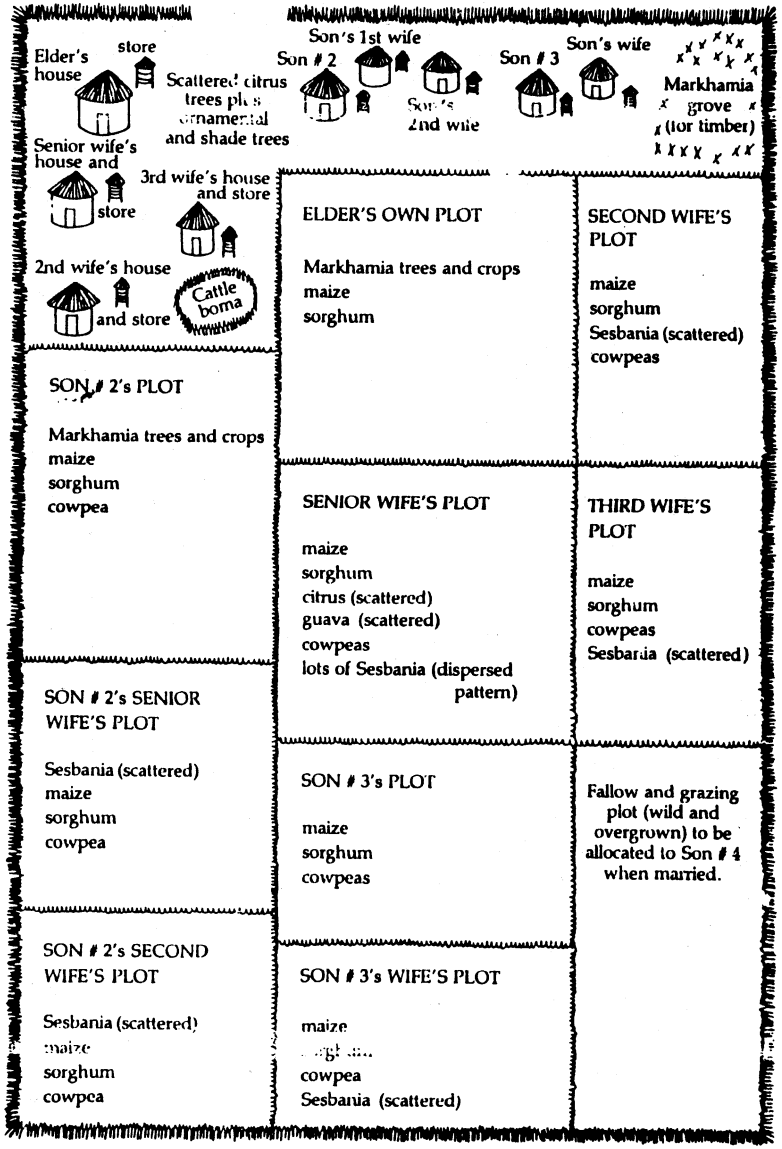
Grace answered without hesitation. "Oh, there's no doubt. Age plays a part and so does education. But so does personality and group experience and the changing shape of families. Every woman in this district is probably involved in some activity that wasn't part of her mother's world. My advice is to make this activity available and let some women employees or leaders set an example, without a lot of fanfare. Then stand back and watch: you'll see some women planting trees, and some will find roundabout ways of getting the job done, and some will bring their menfolk into the picture as partners. Just be prepared to work with a whole range of different approaches."

Mary turned to David with a smile. "Well, David, it looks like you've got you work cut out for you. All this real-world complexity is going to demand a lot of creativity and flexibility from you and your field staff."

"And," David replied, "I've got to write a work plan and an activity calendar that give our head office and our field workers something concrete to hold onto. Let's talk about how to design this flexible construction over dinner."

Figure 7-3

Achola's Sketch of a Typical Farm in Siaya



Legend

Living fence around compound

Internal hedge, usually low, weedy hedges or grass strips

APPENDIX 7-A: AGROFORESTRY PRACTICES

RECOMMENDED AGROFORESTRY ARRANGEMENTS

Alley cropping. Hedgerows of closely spaced trees are planted along the contour at regular intervals (three to six meters). (See Figure 7-A.1). Nitrogen-fixing trees are selected. Depending on the species, the trees may be a source of fuelwood, fodder, mulch, or poles. When used in alley cropping, trees must be cut so that light is available to the crops either through "coppicing-small"--keeping plants short and bushy--or pruning or pollarding so that the canopy is well above the croplands and the diameter and density are reduced. When used for mulch, the trees are pruned frequently, the leaves and branches are applied as a mulch, and the branches are collected for fuelwood after the bark has decomposed. (See Figure 7-A.2). There are reported instances in Kenya that one acre of firewood per year and added forty kilograms of nitrogen to the soil. With some species, nitrogen fixation also occurs through the root nodules.

Living fences. Trees are planted close together to create a density sufficient to create a barrier between areas. They can be used for protecting homestead or cropland from animals, and can be distinguished from boundary marking by the creation of a barrier rather than just marking. Depending on the species, the trees can be a source of fuelwood, mulch, poles, and possibly fodder. Management such as early coppicing or very selective pruning which promotes density is required.

Boundary planting. Trees are planted to mark boundaries and may be, as in a semipublic area, an economic area for planting trees (see Figure 7-A.3). The boundary may serve a combination of functions, such as windbreak, fuelwood production, fruit production, pole production, protection, and demarcation. Spacings vary according to the species used and the specific end-use of the tree. In areas where animals graze freely, browse trees are not desirable in croplands or as fences; where cut-and-carry feeding is the mode, trees which produce fodder may be desirable.

Windbreaks. Large species of trees, often planted in combination with shorter species, are set at right angles to the prevailing winds to direct wind away from plants or the homestead (see Figure 7-A.4).

Home gardens. Plantings in home or school compounds can vary from a few trees for shade or decoration to dense multistory plots of fruits and vegetables. In addition to shade and ornamentation, home compounds may include trees or shrubs for medicines, herbs, and fruit, and they provide a good environment for seedling nurseries. Fruit trees are mostly planted on compounds. For primary schools the fast producing papaya (**Carica papaya**) and passion fruit (**Passiflora edulis**) are recommended. Fruit trees help improve nutritional status. (see Figure 7-A.5).

Woodlots. In addition to commercial species, new or enriched woodlots may include new species such as multipurpose trees, herbaceous crops, or controlled animal grazing.

MANAGEMENT PRACTICES

Cutting the tree at different points in the life cycle or with different frequencies affects the growth and ultimate shape of the tree as well as the potential for harvesting different products. Earlier and more frequent cutting favors leaf production over wood.

Coppicing. Technically, coppicing refers to a tree's response to being cut at the base and continuing to grow many branches which can be used for poles or fuelwood. For instance, some species when cut for timber continue to produce poles. Trees which coppice readily produce more fuelwood or poles and do not need to be replanted as often. AS a verb, "coppicing" is also used to describe intentional cutting for just such a response. "Coppicing-small" refers to cutting done early in the tree growth, producing more of a bush and providing leaves and light branches for mulch or fodder. "Coppicing-large" refers to the continued production of poles after the main trunk has been harvested. (See Figure 7-A.6).

Lopping. The side branches of the tree are cut, not the main stem. This technique is often used for collecting fodder for animals.

Pollarding. The tree is cut at chest height or higher and it branches out at that height. This technique is often used in alley cropping to remove the canopy for the growing season, or to create fence posts in fences (in combination with wire or with smaller species). Pollarding of fodder species keeps leaves out of the way of animals, reserving them for cut and carry. (See Figure 7-A.6).

Pruning. Branches of tree are selectively cut, depending on their purpose. Pruning may be used for harvesting fuelwood, for shaping the main trunk for timber (often a compromise is necessary here), for shaping the growth of fruit trees, or to let in light with alley cropping.

Mulching or composting with tree leaves. Trees may not be present in the cropland, but leaves and twigs are used either as mulch, laid directly on the soil in the cropland, or as compost. In composting, twigs and leaves are combined with manure and/or long grasses; the gradual decomposition leaves a rich, organic fertilizer.

Thinning. Trees planted close together may be selectively cut down or thinned in order to reduce density and to manage the spread of a prolific species.

PLANT PROPAGATION

Plant propagation may be by direct seeding, by grafting cuttings, or by transplanting wildlings or nursery seedlings. Some trees regenerate rapidly after being cut, producing additional harvests and requiring less frequent replanting. Development of seedlings for transplanting requires access to water.

TECHNICAL SPECIFICATION FOR AGROFORESTRY TECHNOLOGIES

In designing and experimenting in agroforestry, researchers need to determine the technical specifications for a particular practice. Some of these specifications are known. They are given by farmer preferences--production of straight marketable poles or a planting density sufficient to prevent passage of animals--or must be adapted for local soil and climatic conditions. Other specifications are unknown and are the subject of experimentation with measurement of various kinds of interactions. For example, optimum within-row or between-row planting will vary with location, species of both trees and nearby crops, and likely management practices. What is optimum will depend on what is being considered--a living fence where density is an issue, or alley cropping where competition (for light) or contribution (to soil fertility) are important effects. The technical specifications of an agroforestry design or experiment include what is known and what is still unknown in the following categories:[1]

1. *Functions or uses*: What will the agroforestry technology achieve for the farmer?
   - --Products
   - --Services (windbreak, fencing, etc.)

2. *Locations*: For what landscape niche is the technology intended and what are the site characteristics?
   - --Space available or desirable
   - --Required soil and topographic conditions
   - --Access to water

3. *Arrangements*: What plants should be in association? What geometry? What spacing?
   - --Number of rows
   - --Between-row spacing of like species or in conjunction with crops
   - --In-row spacing
   - --Proportionality with one or more species (tree or crop)
   - --Orientation to sun and wind

4. *Components or species*: What are the criteria for selecting species--Climatic suitability? Products? Growth characteristics? Responses to management?
   --Specifications common to all
   --Specifications for particular uses or functions
   --Combinations of species or tree species and crops

5. *Technology management*: What management of trees and crops will produce desired results?
   --Time and method of establishing trees (including seed acquisition)
   --Desirable frequency of lopping or pruning
   --Desirable form of cutting (coppicing, pollarding, etc.)
   --Harvesting cycle or timing
   --Training of trees to desirable shape
   --Removal
   --Management of associated nonwoody species
   --Specific inputs required--labor, land, soil amendments, polybags, etc.
   --User characteristics--who is likely to use; interest in using

Figure 7-A.1

Alley Cropping with Maize and *Leucaena leucocephala*

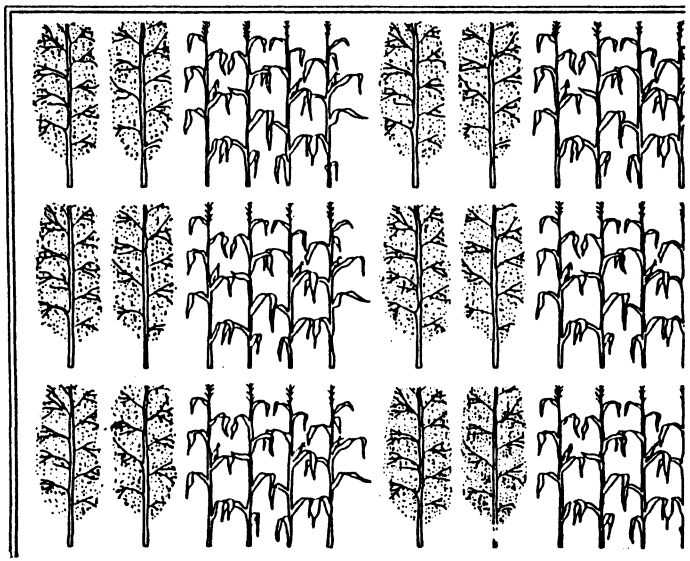
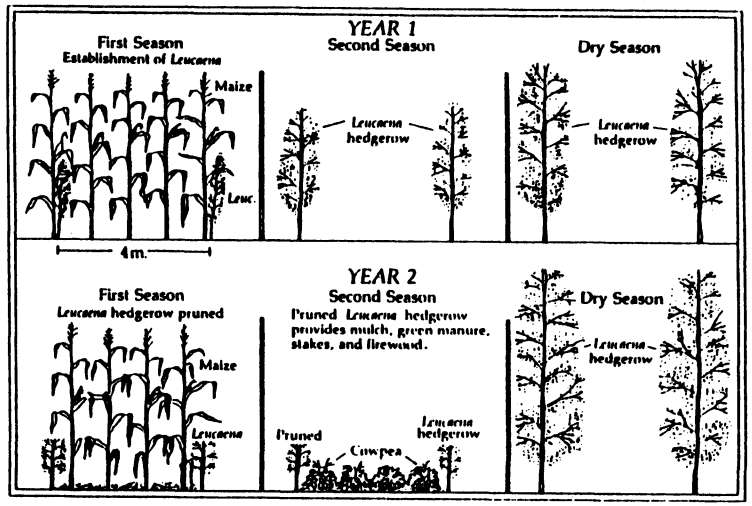


Figure 7-A.2

Cropping Sequence Diagram for Establishing *Leucaena leucocephala* Hedgerow for Alley Cropping with Sequentially Cropped Maize and Cowpeas



Source: Adapted from B.T. King, G.F. Wilson and T.L. Lawson. *Alley Cropping: A Stable Alternative to Shifting Cultivation*. Ibadan, Nigeria: International Institute of Tropical Agriculture, 1986.

Figure 7-A.3

Boundary Planting of Trees Around a Maize Field

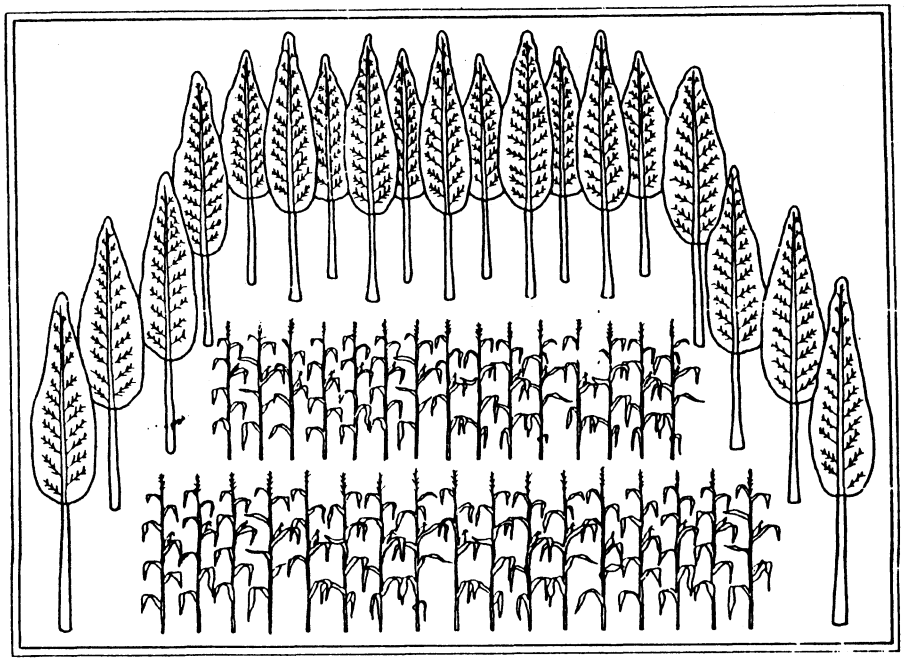


Figure 7-A.4

Windbreak Design

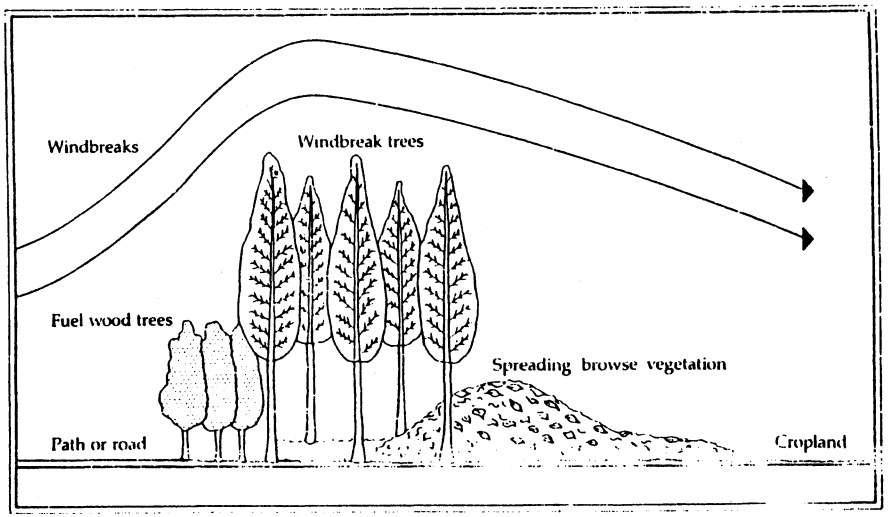


Figure 7-A.5

Schematic Representation of a Home Garden with Tree, Fruit and Vegetable Crops

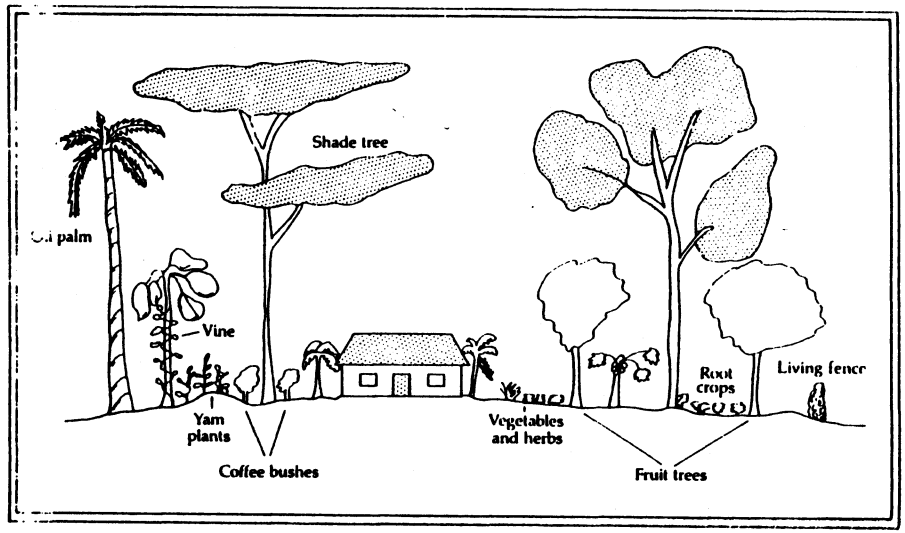
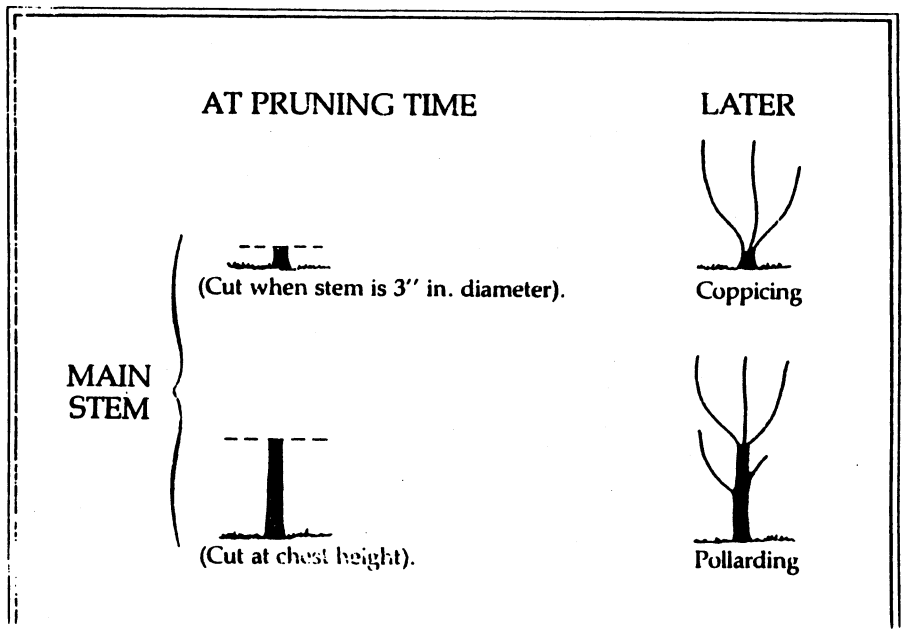


Figure 7-A.6

Pruning the Main Trunk: Coppicing and Pollarding



NOTE

1. Sara J. Scherr. 1988. Pilot Survey of Adopted Agroforestry Practices in the CARE Agroforestry Extension Project. Kisumu/Siaya Trip Report. 23-25 November and 30 November-4 December 1987.

Appendix 7-B: Species Available to Group Nurseries: First Season

Zone	Species	Recommended Uses
North	*Cassia siamea	Fuelwood, fencing, charcoal
	*Cupressus lusitanica	Fuelwood, timber, fencing
	*Eucalyptus spp.	Fuelwood, fencing, timber, poles
	*Gliricidia sepium	Fuelwood, fodder, charcoal, soil fertility, mulch
	*Grevillea robusta	Fuelwood, timber, soil fertility, poles
	*Leucaena leucocephala	Fuelwood, fodder, soil fertility, poles
	*Psidium guayava	Fruit (guava), fuelwood
South	Balanites aegyptiaca	Fuelwood, fodder, timber
	*Parkinsonia aculeata	Fuelwood, fodder, fencing, charcoal
	Prosopis chilensis	Fuelwood, fodder, soil fertility, charcoal
Both	Markhamia lutea	Fuelwood, fodder, timber
	*Passiflora edulis	Fruit (passion fruit)

*Exotics or newly introduced

Appendix 7-C: Traditional Agroforestry Practices in All Zones

Zone	Practices
All	*Markhamia lutea* intercropping with food crops (tolerated for pole/timber value)
	Sesbania sesban intercropping with food crops (tolerated, used for fuel)
	Shade trees in home compounds
	Euphorbia and sisal boundary plantings
North	*Albizia* intercropping with food crops (tolerated for its by-products)
	Eucalyptus/cypress/markhamia wood lots (common, commercial, promoted by Forest Dept.)
	Cypress fencing of home compound
	Home compound gardens with useful trees
South	*Acacia spp.* intercropping with food crops (tolerated for fuelwood, etc.)
	Euphorbia fencing of home compound
	Markhamia intercropping with cotton (tolerated)
	Acacias and other fodder trees in pastureland
	Albizia intercropping with food crops

Source: CARE Kenya. Results of Diagnostic Studies of CARE Project.

Appendix 7-D: Recommended Agroforestry Species and Their Uses: First Season

First Season Species	Uses	Charcoal	Cordwood	Erosion control	Fencing	Fodder	Food	Fuelwood	Medicine	Mulch	Ornamental	Poles	Shade	Soil fertility	Timber	Management Practices	Coppice: small	Coppice: large	Pollard	Prune	Hull tree: renewable	Hull tree: single harvest	Crown/Habit	Fast	Medium	Slow	Agroecological Zone	North	South
Balanites aegyptiaca	●	●				●	●	●					●		●					●					●				●
Cassia siamea*	●			●			●	●		●	●	●	●		●		●			●	●					●	●		●
Cupressus lusitanica*	●			●				●				●	●	X	●						●				●		●		●
Eucalyptus spp.*	●		X					●				●	●	X	●		●				●					●	●		●
Gliricidia sepium*	●		●			●		●		●			●	●	●		●	●			●					●	●		●
Grevillea robusta*	●			●				●		●		●	●		●						●				●		●		●
Leucaena leucocephala*	●		●			●		●				●	●	●	●		●	●			●					●	●		●
Parkinsonia aculeata*	●		●			●		●		●			●		●		●				●					●	●		●
Passiflora edulis*							●																				●		●
Prosopis chilensis*	●			●			●	●				●	●	●	●						●					●	●		●
Psidium guayava*	●						●	●							●						●					●	●		●

* Exotic and newly or recently introduced species.
X = Negative effect

Appendix 7-E: Characteristics and Main Problems of CARE Nursery Groups

Group	Mutumbu	Ginga	Nyasanga	Warianda	Odkoga	Ugege	Nyawara
Women	24	22	28	6	8	80	0
Men	2	0	4	5	8	20	4
Nature of Group	Women's	Women's	Women's	Chief's	Women's	Women's	Chief's
Main problems ranked[a]							
Pests[b]	1	—	4	1,3,4	—	3,4,5	2
Striga	1	—	—	—	—	—	3
Soil Fertility	2	—	1	5	2	1	1
Ticks	3	—	—	—	—	—	—
Liverfluke	4	—	—	—	—	—	—
Rainfall	—	1	—	6	1	2	—
Fish	—	2	—	—	—	—	—
Cash	—	3	—	—	3		5
Fuel	—	4	2	—	4	7	4
Fodder	—	5	3	7	5	6	6
Land	—	6	—	—	—	—	—
Seasonal labor	—	—	5	2	—	—	—
Number of species used							
Crops	8	8	10	9	16	15	15
Fruits	11	6	10	6	11	9	1
Fuel	13	6	13	7[c]	8[c]	14	10
Timber	5	3	4	9	6	—	6
Fodder	8	7	7+	14	7	5	—
Handicrafts	2	7	4	6	—	—	—
Medicine	3	2	0	—	—	—	—
Planted on cropland	4	3	2	7	?	2	—

[a]Problems ranking: 1 = most serious, 7 = least serious.
[b]Multiple listings reflect ranking of specific pests.
[c]Includes species used for charcoal production.

Appendix 7-F: Field Notes from Group Interviews

	Mutumbu Women's Group	Ginga Women's Group
Agroecological zone	North, high potential, small hectarage	South, Lake Victoria shore; one rainy season
Farming System	Mixed—commercial and subsistence; strong dependence on off-farm income; intercropping system common in food and cash crops	Subsistence mixed-cropping with some cash crops (cotton, maize, or fruits), one crop per year; most do hand tillage; fishing and livestock important
Group Profile	Clan based, well-to-do clan; nursery in operation with expansion underway; twenty-four women and two men at meeting	Low-income farmers of fishing village seeking to supplement cash income. Formal group is recent; previously labor exchange on-farm. Twenty-two women and two male elders present at meeting
Household types	Extended family groups headed by male elders; many female-headed subhouseholds (common cooking) with absentee (wage labor) husbands	Few female-headed households; women farm and men fish, but men help with farm and women process and market fish; extended family and polygamous family units; shared compounds; each adult woman manages her own plot with husband
Crops	Fruits: Eleven species; bananas, papaya, citrus, and mango sold for cash	Fruits: Six species; tamarind for cash
	Other: Eight species; onions, potatoes, maize, beans, groundnuts for cash; finger millet, sugar cane, cassava for subsistence only	Other: Eight species; sorghum (preferred, most resistant), maize (bad yields), groundnuts and cotton for cash. Stored food is women's property; food in fields is men's property

Continued on next page

Appendix 7-F, *continued*

	Mutumbu Women's Group	Ginga Women's Group
	Animals: Cattle (savings, long term), sheep, goats, chickens (sold often for cash)	Animals: Cattle, sheep, goats, chickens, one donkey, four oxen
Fuelwood	About half use charcoal in rainy season; fuelwood also purchased. Eleven species collected. Timber commonly purchased, though some sell	Six species listed; fuelwood needed for smoking fish
Fodder	Crop residues, napier grass, *Sesbania*, sodom apple; problem in dry season	Seven species listed (see below)
Most commonly used species	*Markhamia*—fuelwood, timber, handicrafts *Cupressus*—fuelwood, timber *Sesbania*—fuelwood, timber, fodder *Albizia*—fuelwood, timber, medicine *Eucalyptus*—timber	*Balanites*—fuel, subsistence fruit, fodder for cattle and pigs, spoons, building storehouses *Tamarindus*—fuelwood, fruit for sale, fodder in dry period for pigs and cattle *Markhamia*—timber, dry season fodder for cattle and pigs; preferred for furniture *Euphorbia*—fences, in very dry time fodder for goats; not liked *Cassia siamea*—timber, furniture, dry season fodder for goats
Planted in cropland	*Markhamia*—dispersed (agreement by two-thirds of group) *Sesbania*—dispersed (one-seventh of group) *Albizia*—lower density than *Markhamia* or *Sesbania* *Eucalyptus*—with sugar cane	*Markhamia*—left in cropland *Tamarindus* *Papaya*—planted *Cassia siamea*—infrequently; opinions divided over its effect
Main problems	Crop pests (striga weed, maize stalkborer, wild browsers, termites), soil fertility, ticks on animals, liver flukes (in people)	Rainfall, fishing catch (fish population disturbed), cash, fuelwood, cattle fodder, increasing land shortage
Possible planting sites	Cropland—about one-half Boundaries—all Woodlots—many Grazing land—few (a little on own farms) Home compound—most	Cropland—some Boundaries—all Woodlots—few Grazing land—few Home compound—most
Species suggested	*Markhamia, Albizia, Eucalyptus*	*Cassia* and *Eucalyptus*—for fuel and poles in boundaries and woodlots *Markhamia, Tamarindus*—in cropland *Balanites* and *Ficus spp.*—fuel, fruit, fodder; in cropland, fence, compound
Potential for trial sites	Eight people for trees in cropland	Most willing to try fence lines; four people will provide sites
Nursery objectives	Mix with commercial vegetable gardens, sell plants for cash seedlings for home planting	Vegetables for home, sale; seedlings for home, sale; want fruit, fuelwood, poles
Comments	Only two people have own grazing land; common use of some private plots and at roadways is major source of fodder. Off-farm income is a mainstay of the farm economy; major preoccupation of women's groups is for increased cash incomes, whether seedling-as-cash crop, fruit trees, poles for sale, or high-cost vegetable crops. Some interest in reduced spending for fuelwood; would plant more on farm	Hevay use of fuel for smoking fish; pay Ksh 5–8 per headload for fuelwood which will smoke twenty fish. Interest in replacing *Euphorbia* in hedgerows with fast-growing and more manageable fuelwood species. Men are present, employed, and actively interested. Economy of farm/fishing families is fairly commercial. Interest high for selling tree products or substituting own tree products for those now purchased, especially fuelwood used for smoking fish.

Appendix 7-G: Technology Prototypes, Best Bets: First Season

North, Higher Potential Zones	South, Lower Potential Zones
Alley-cropping Crop: Maize Species: *Leucaena leucocephala, Markhamia lutea, Gliricidia sepium* Spacing: Rows 4.25 m (trees) x 15 m (crops); within rows—maize 0.75 m x 0.3 m; tree seedlings; 0.5 m along the row	Alley-cropping Crop: Maize Species: *Leucaena leucocephala, Markhamia lutea* Spacing: (same as in North)
Fuelwood Species: *Cassia siamea, Grevillea robusta, Eucalyptus spp., Markhamia lutea* Arrangement: Woodlots	Living fences Species: *Parkinsonia aculeata, Prosopis chilensis*
Hedges and windbreaks Species: *Grevillea robusta, Cassia siamea*	